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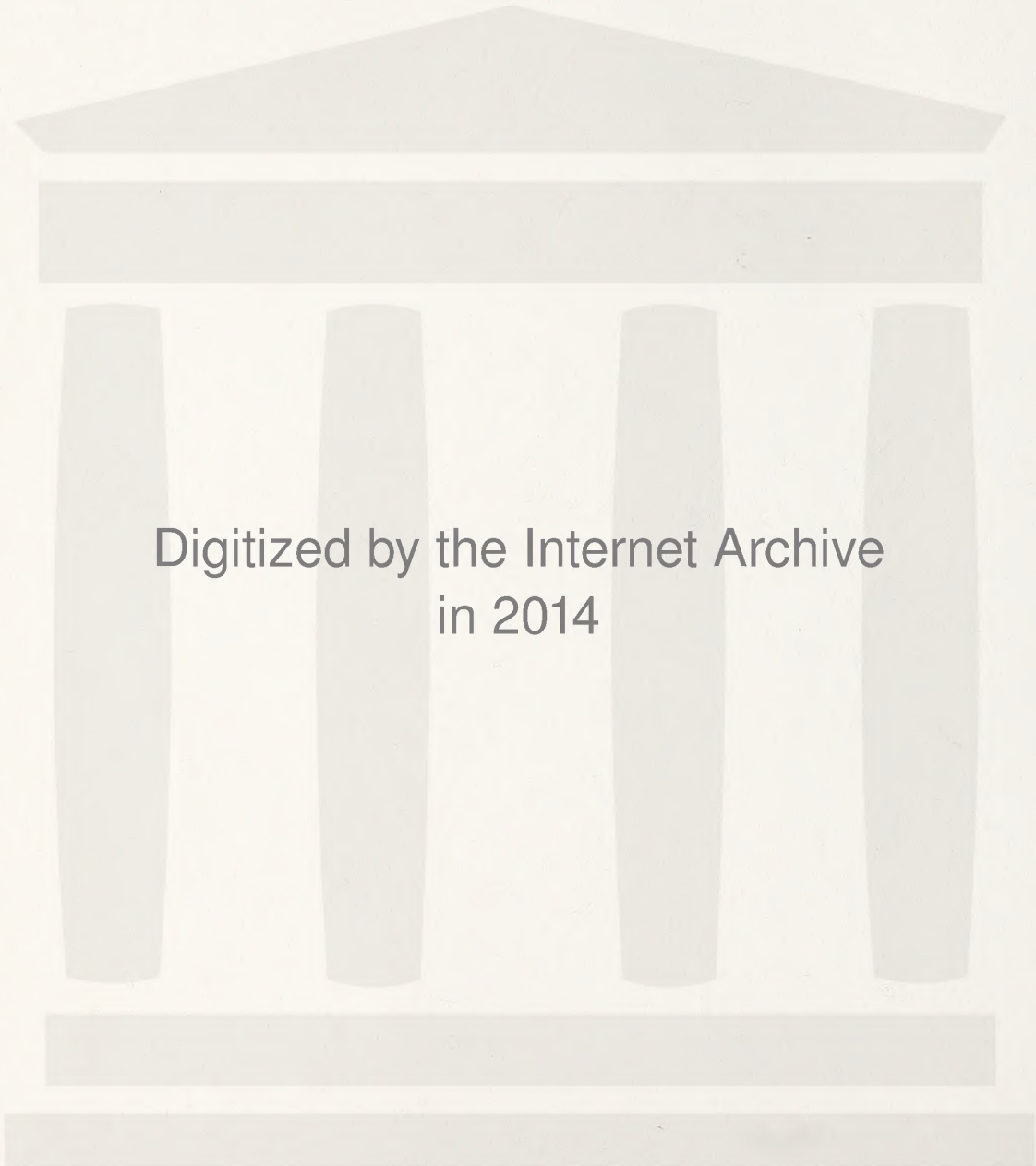

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Wildlife

IN NORTH CAROLINA

JANUARY 1976

DURANT RALL

PHOTO BY REX GARY SCHMIDT

ALERT

The whitetail depends on its acute senses to detect danger nearby. Its hearing and sense of smell are particularly keen.

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Wildlife
IN NORTH CAROLINA ■

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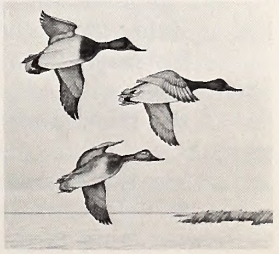
An objective of all levels of government should be to achieve and sustain a balance of the social, ecological, and economic benefits derived from natural resources. Without such balance none of the factors on the scale will be worth weighing.

We hope that the canvasback hasn't been in your sights this season (nor the redhead and swan, for that matter); there is no open season on them. The canvasback is a fine bird and one that perhaps one day will make its way back to abundance. The slope of the forehead distinguishes it from the redhead. Painting by Durant Ball, Hampton, Virginia.



CURRITUCK COOTS

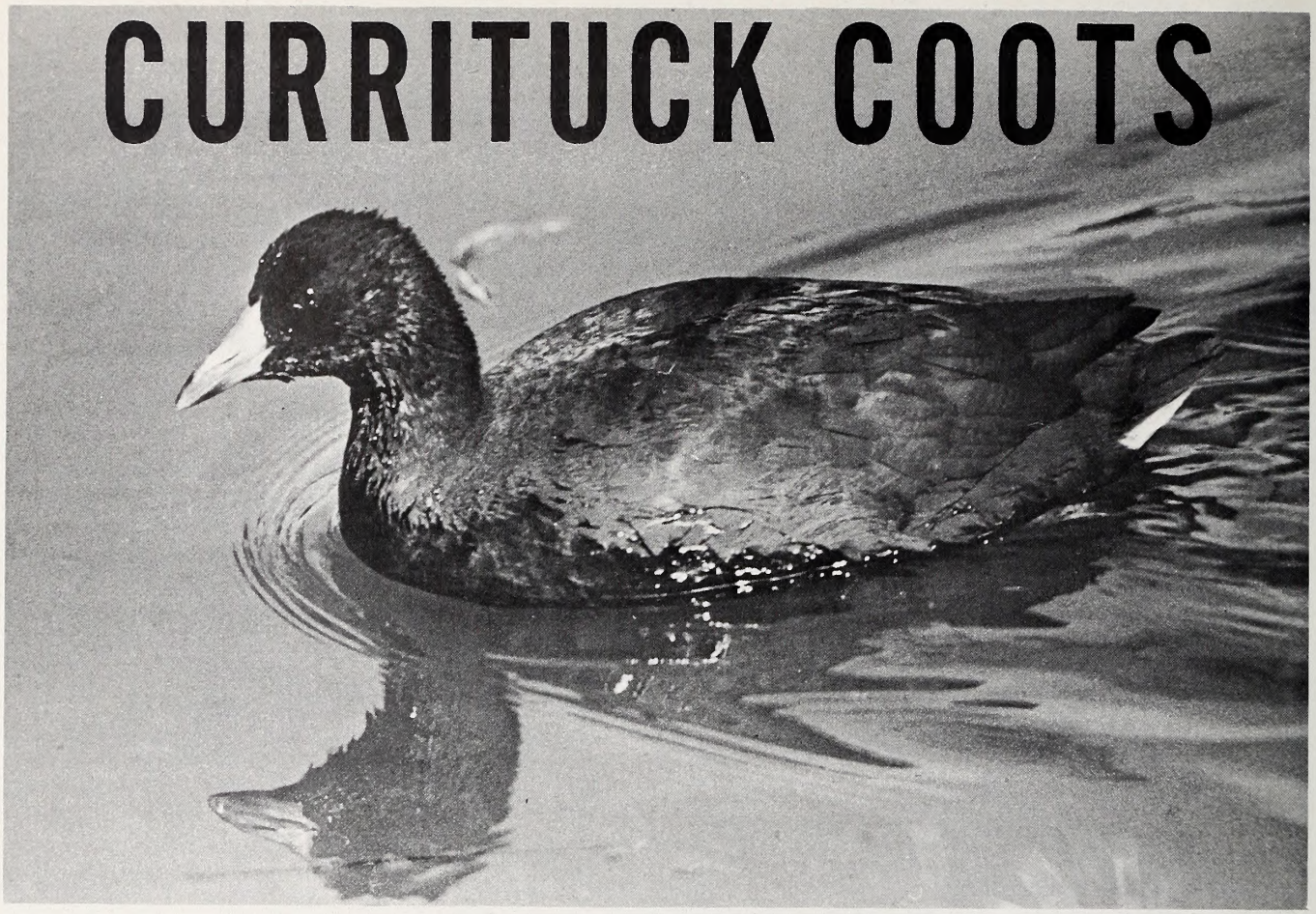


PHOTO BY W. T. BRYSON

by Bob Gooch
Troy, Virginia

MY grip on the cold stock of the shotgun was deathlike.

"Relax," I told myself.

But that was impossible. A big flock of slate-gray birds were winging toward our blind at the edge of the marshes—barely skimming the choppy surface of big Currituck Sound. Beside me, my hunting partner Joel Arrington, seemed relaxed—less excited—almost disinterested.

Now the birds were within easy range.

Out of the corner of my eye I saw Joel rise to a shooting position, gun to his shoulder.

Unwinding a bit, I shouldered my own battered old automatic, and squinted along the shiny barrel. Isolating a lone bird, I somehow managed to forget the rest of the flock. The muzzle of my gun swung with the bird, and suddenly there was a foot or two of daylight between it and the bird's white beak. My trigger finger curled, the old scattergun roared, and the bird plummeted toward the blue water of the North Carolina sound. It hit with a splash and floated slowly with the current, its dark feathers ruffled by the light breeze.

That was my introduction to the American coot, a ducklike bird that is known to millons as mud hen. Though that productive hunt had produced black ducks, widgeon, scaup, ringnecks and gadwall, I found the coots particularly intriguing.

The gregarious birds are better known as blue petes along Currituck Sound, a long expanse of water running from the Virginia border to Point Harbor and Kitty Hawk. Elsewhere in their wide range they may be called mud hen, ivory gill, crow-bill or blue peter. Scientists know them as **Fulica americana.**

"What's wrong with coots?" I had asked earlier as a whole flock clucked, swam and dived before our blind, but just beyond gun range. Once they had moved closer, and I expressed a desire to bag one, but Joel and Colon Grandy, our youthful guide, shook their heads.

"Most duck hunters ignore them," said Joel.

But I was from the hill country, anxious to bag some ducks and here a whole flock of ducklike birds were taunting us.

Minutes later a passing boat flushed the birds toward us, and I ignored my hosts temporarily for a little action. I was delighted that Joel elected to join me in the shooting. We added two coots to our growing bag of ducks.

Coots are notoriously poor flyers—not much of a challenge for a crack wingshot, and this is one of the reasons for their lackluster popularity. And while from a distance they have the

PHOTOS BY THE AUTHOR

The "covered wagon top" waterfowling craft is often used on Currituck. Federal regulations require that the motor be turned off and the boat stopped before shooting. Two coots (far right) add to a Currituck game bag of ducks.

appearance of ducks, they lack the more usual waterfowl characteristics. Their short white bill more closely resembles the beaks of upland birds than the flat bill of a duck. Their green Martianlike legs and feet contrast sharply with their slate-gray bodies and darker heads. And while their feet feature well developed flaps or lobes, that aid in swimming, they are quite different from the web feet of our more popular waterfowl.

Still, coots are recognized as game birds, and are hunted under our Federal Migratory Bird Regulations. The chunky birds are outside of the point system that determines the daily limit on ducks in most states. Consequently, they offer the hunter a rich bonus. The North Carolina limit, for example, is 15 coots per day.

Some hunters refuse to shoot coots. "They won't decoy," they say.

The birds are excellent swimmers but poor flyers, and this is a major reason they are a poor choice for blind hunting over decoys. They spend most of the time on the water—swimming, diving, clucking and playing. Even hunters who do not shoot them enjoy their antics.

When they do take to flight, which is seldom unless disturbed, coots patter along for a considerable distance with their feet skimming the surface. Once aloft, their neck and legs are extended and their feet protrude behind their bodies. The striking white trailing edge of the inner wing is very conspicuous once the bird is in flight.

A big flock of coots played just beyond gun range of our Currituck blind during most of the day. Occasionally the current would bring them almost within gun range, but at the last minute they would take to their awkward flight and sail back to a favorite spot on the lee side of a marshy island.

Since they do not decoy the more usual hunting methods will not take many coots. The observing hunter, however, can usually position himself in the marshes so that the birds will eventually pass within gun range. He can then flush them for some fast shooting. A good wingshoot should be able to take several of the slow flying birds on the flush.

Most coots are taken accidentally, however. When there is a good deal of activity on the water—other hunters, boaters and fishermen—the birds are flushed frequently and many fly within gun range of a duck blind in the course of a day in the marshes.

The coot has a chunky body and the average bird will weigh between one and a half and two pounds. Their favorite food is vegetable matter—seeds, leaves, roots of aquatic plants and young crops. But their diet also includes insects, snails, tadpoles, worms and small fish.

The meat of the coot is dark and delicious. In many areas the natives prefer them over the more popular ducks. "A native will trade you two mallards for a single coot," said one waterfowl game manager. Joan Cone, an expert at game cookery, says coots should be skinned instead of plucked. She also recommends removing all of the fat and cooking the birds as you would upland birds instead of using waterfowl cooking methods.

Coots are hardy and they remain in northern marshes until winter with its accompanying ice and snow drives them south. When spring arrives they head back north early, soon after the first big thaw.

The birds are found throughout the United States and Canada, and hardly a body of freshwater anywhere is without coots at least part of the year. They like freshwater marshes, ponds and rivers, and they will use salt water bays. However, the Currituck Sound water we dropped those coots on is fresh, protected from the Atlantic Ocean by a thin strip of sand.

Coots are fun to watch whether you hunt them or not. As they swim and dive they make a variety of grunts, squawks, cackling and clucking sounds. In fact their varied and interesting chatter is sometimes recorded and dubbed into films and tapes to provide jungle background noises for movies and television.

Interesting birds, those coots.

PART 2

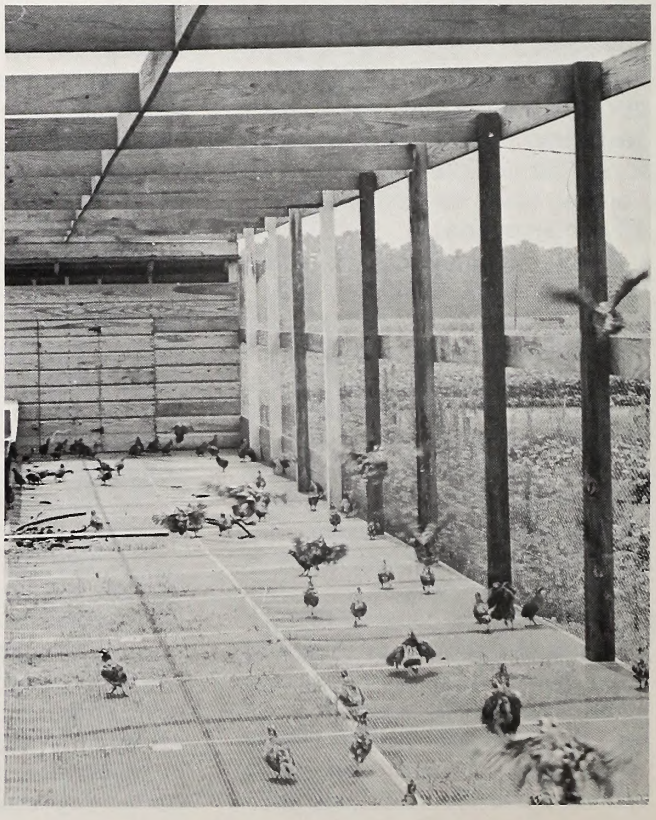
THE BOBWHITE QUAIL

by Rod Amundson

Art work by Wallace Hughes

This is the conclusion of the bobwhite quail discussion begun last month. Management is examined.

The bobwhite quail is a fine game bird and responds to various management procedures. Populations do vary from year to year, even under the best of management. Pen-reared birds (below) are seldom the answer to better hunting under natural conditions. They are often used in commercial shooting preserves.



• Few species respond so quickly to management or mis-management as quail. They are so closely tied to the soil that land management practices which benefit the soil—and thus agriculture—benefit quail. Land management practices which result in eroded, worn-out soil have the opposite effect. But first, let us dispose of artificial stocking of quail as a management practice. Artificial propagation and stocking of any game species is justified only when suitable habitat in a given area is present, but the desired species is totally absent. There is not a single county in North Carolina which does not have at least 100 coveys of quail. Every county in the state is producing as many quail as its habitat will support. In other words, the amount of cover available to quail is already kept saturated with birds through natural reproduction. Additional pen-reared birds would be a total waste. The way to increase the quail production on a farm or in a county is to increase the amount of suitable habitat. By natural reproduction the birds already living in the area will stock the newly created habitat. The following excerpt from a wildlife resources survey report by William L. Hamnett is an example of habitat management versus artificial stocking:

"A gentleman who owns a 456 acre farm in the northwestern section (some of the best bird territory in Cabarrus County) reports that starting seven years ago he released 300 birds on his farm over a period of four years. At present he has six coveys of birds on his place and there has been very little hunting done since the birds were released. Over-hunting has certainly not hurt these birds but an interesting fact came to light during the discussion with this farmer. He made the remark that the big field in front of his house (about 15-20 acres) had as many birds 25 years ago as his whole farm does now. On being asked what the difference was between the field then and now he said that it was planted to the same crops (wheat this year) but there was about a half acre of rocks in the center of the field which has been allowed to grow up in a thicket and a brushy fencerow dividing the field. When he bought his first tractor he removed the fence and the rocks, making one continuous field. At the present time there are no birds using this area."

Fortunately for all concerned, North Carolina sportsmen make few demands for artificial stocking.

Nest sites are important (above) as is a suitable place to rear the young (below).

Predators like this skunk, may destroy eggs and young. The harvestable surplus is utilized by the hunter (below).

Their money can be spent for more profitable projects.

Two imported plants have proven a boon to quail and quail hunters in North Carolina. Shrub and serecia lespedeza plantings have been so successful in providing food and cover for quail, and for producing coveys of quail where none existed before, that hunters (in all sincerity) have reported that their dogs actually look for lespedeza border strips in which to please their masters by freezing on a covey of birds. Besides providing homes for quail, lespedeza plantings halt soil erosion and utilize otherwise useless border strips between agricultural crops and forest lands.

The ever-increasing demand for quail can be supplied abundantly when sportsmen, farmers, and conservationists work together to provide quail habitat throughout the State.

Regulation and protection are as necessary to successful quail management as they are to any other game species. Biologists keep a constant check on quail abundance and scarcity, and make recommendations for shooting seasons and bag limits accordingly. Man can influence all factors of physical environment except weather. Severe winters and wet nesting seasons can decimate quail despite otherwise ideal habitat. This must be taken into consideration in regulating the annual sporting harvest.

The concept that "shooting into coveys to scatter them" is necessary to quail management is pure poppycock. Any competent observer of quail knows that as soon as a covey has been shot into (if it is not hunted down to the last bird) the birds begin sounding their assembly call and gathering together again. This is usually accomplished within an hour after the birds were disturbed, and the covey remains together until another party of hunters or some other disturbance scatters them. Frequently coveys which have been reduced to a few birds will join another depleted group to form a new group.

Despite the many dangers through which quail must pass during the breeding season, the shootable surplus of birds in the fall is surprisingly large. Quail tend to produce more of their kind than local habitat can carry through the winter. This means that many of the birds in the field during the fall will have succumbed to environmental perils by the time a new breeding season is reached. The differential between the fall population and the spring breeding population is the surplus that may be harvested without endangering the total population. The percentage of birds which may be shot may vary from 40 to 80 per cent, depending on local conditions. It is simply a matter of using for food and sport, birds which might otherwise be killed by predators, disease, starvation, or severe weather.

The management of quail is largely the responsibility of wildlife administrators and farmers, but sportsmen have a very real responsibility too. Sportsmen can completely destroy the quail population of a given section even though they adhere carefully to the rules on bag limits and seasons. All too often hunting parties have been guilty of shooting into a bursting covey and then shooting the scattered singles down to the last crumpled corpse. Such conduct is not only extremely poor sportsmanship; it is just plain stupidity.

The Wildlife Resources Commission of North Carolina has carried on a sound and productive program of quail management. But this program will succeed only so far as it is actively supported by sportsmen and landowners. It is safe to say that the quail management program of this state can make it one of the best quail states in the country. ⬍⬍

The Ruffed Grouse
King of the Upland

by Gerald Almy

PHOTO BY LEONARD LEE RUE III

ASK a grouse hunter what he would choose if one wish could be granted him and you'd probably be surprised at his answer. It wouldn't be a new shotgun, more grouse, or better weather. His one desire would probably be for a spare pair of legs!

Thrashing through grapevine thickets, briar patches, and tangles that would scare the hardiest of beagles, for a chance of flushing a grouse which, chances are two to one he won't even see, let alone get a shot at, along the edges of thousand foot ridges—this is paradise for the grouse gunner.

But after four or five hours of such strenuous exercise, most partridge hunters feel like they are walking on a pair of flimsy rubber bands. It would be a source of neverending delight to Old Ruff's devotees if they could simply trade off their worn pair after a morning in the thickets for a sturdy, unexhausted set of legs to carry them back out into their beloved forests to finish out the day.

The grouse gunner is a unique breed. Moments of the supreme consummation of his sport — when the thunderous explosion of a frightened pat finds the gunner on both feet, unencumbered with briars, vines, and saplings, when the gun swings quickly on a departing grouse barely visible in the thick brush, and a soft puff of brown feathers signals a downed bird—these come few and far between.

But the grouse hunter is often satisfied with less than the ultimate ending. To be out in the forests on a crisp winter day, away from the noise and traffic of the city, to hike through abandoned apple orchards and oak forests for the chance of flushing a grouse, which comes perhaps once or twice an hour, three times at most—this is pure joy for the shooter.

Sure, he likes to bag a bird once in a while, but he also realizes that most of the time the woods will be too dense to see the departing partridge—the sound and perception of the flush will be enough. And if a glance at the fleeting bird is granted him, it usually does not provide enough time to fire before the bird is completely enveloped in the dense shrubbery.

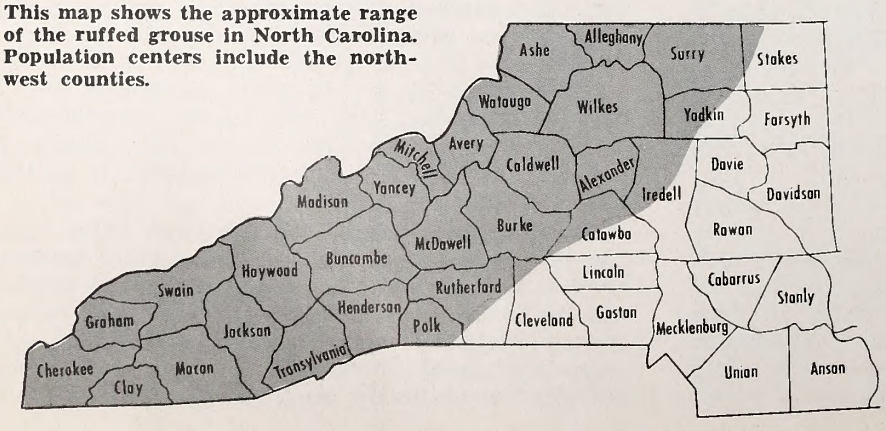
But the grouse hunter is patient. If it would seem that he would be frustrated, he is not. He enjoys flushing a grouse, even if a shot cannot be fired. And he knows that, in time, a pat will grant him his chance, and the king of the upland will come tumbling to the earth, his royal plumage spread in a display of brilliance. There is elation in his spirit as he tenderly caresses the soft feathers, and a touch of sadness.

North Carolina is blessed with thousands of acres of prime grouse hunting habitat in the form of the Appalachian Mountains. Walking along the ridgetops—always with a mind to investigate the thickest, most tangled looking places you see —will yield plenty of flushed grouse to the determined hunter.

But just ambling along the mountaintops aimlessly, without any set strategy will seldom produce many flushes. Your mind should be working constantly as you tread parallel to the ridge, perhaps 50 or 100 feet down from the very top, or occasionally on the very peak. The side reached by the **least** wind and the **most** sun will generally harbor the most pats, for the birds hate swift breezes and love the warmth of a brightly beaming sun.

Even the novice will quickly notice that there are two distinct types of terrain near the ridgetops —the relatively open areas where mature trees predominate, and the thick, snarled patches where young saplings, downfalls, abandoned apple trees, and grapevines prolifer-

This map shows the approximate range of the ruffed grouse in North Carolina. Population centers include the northwest counties.



ate. Be sure from the start that you aren't going to get any birds up in the open spaces—however, delightful a prospect that might seem. Grouse do not find food or shelter in such uncluttered areas, and seldom are they foolish enough to be caught red handed in such clear-shooting spots.

Since a grouse will usually not flush until the hunter stops, the gunner should always be looking ahead as he picks his way through the saplings and underbrush. When approaching a thick area which looks like a covert, don't stop too far off, or the grouse, thinking he has been spotted, may get up too far away for a shot. If you proceed at a steady pace, the birds will let you get quite close before they take off. So try to get as near as you dare to a suspected grouse covert without stopping until you are in an area where you can at least swing the barrel in any direction and have a reasonably open view of the escape routes the bird may take.

If the covert is very large, I like to work my way around the entire tangled area, pausing at intervals of 50 feet or so to try to flush a reluctant grouse that may be scheming to sit tight and let me pass him by. Sometimes it becomes necessary to go right into the middle of such coverts to kick out the partridges, but never stop in an area where you can't swing your gun—chances are this is just when a bird will choose to get up—when you are wrapped up in briars and vines so tight you can't move an inch or see beyond the end of your barrel.

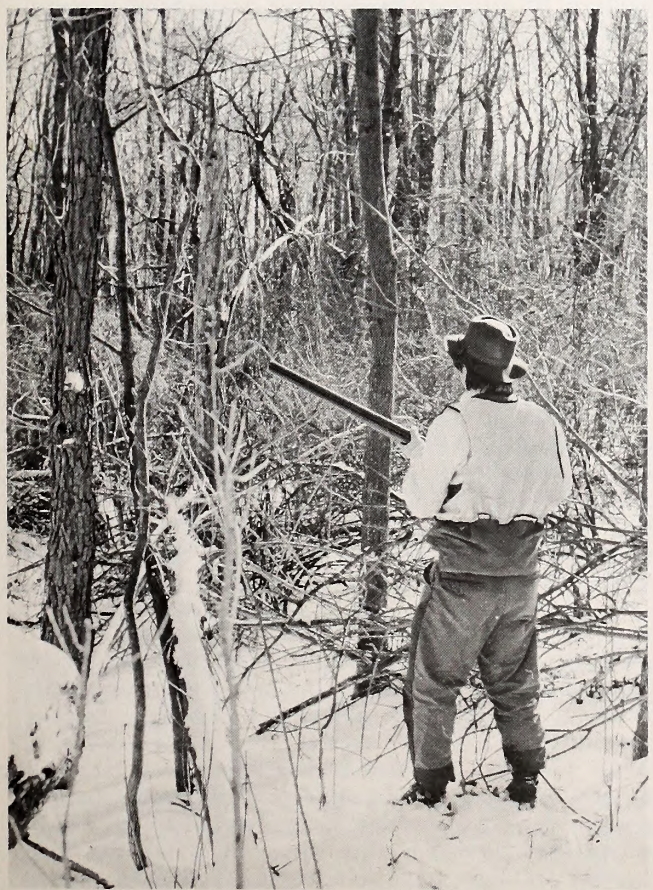
I almost always gun for grouse alone. Unless you have a partner, be he man or dog, with whom you can work effortlessly, as if you both shared a single mind for the trip and knew exactly what each other were doing, it's probably best to pursue your quarry alone.

Given the thick stuff in which grouse are normally flushed, shots usually must be fired rather quickly, while the bird is still at least partially in view. Grouse can blend into the shrubbery amazingly fast, and they are masters at putting every tree in sight between the gunner and themselves. Short fast shots are the norm, as is thick, barely penetrable foliage.

This makes an open cylinder gun, paired with No. 7½ or 8 shot, the ideal choice for grouse. Improved cylinder is also adequate, and many gunners with doubles favor one barrel bored open and one modified, for the occasional long shot that presents itself. My favorite grouse gun is a double side by side 16 which I've cut about three inches off, opening up both barrels completely and lightening and shortening the gun considerably for use in heavy cover. This ruins the gun as far as long shots are concerned, but for most of the grouse, quail, and woodcock hunting I do, long shots rarely materialize—by the time the bird gets beyond the open barrel's range he's generally out of sight.

Don't expect any easy, unhurried shots. Gunning for grouse is quick and instinctive—point, lead, squeeze off, follow through. One second, perhaps two is the most time you will be granted by this quick-witted upland bird that reaches speeds of 50 mph before you can blink an eye. Don't hesitate, or you'll be made the King's pawn, like so many of us before!

A grouse hunter pauses at a "blowdown" which may harbor a bird. This tactic often helps flush tight-sitting grouse. At right, the author admires the russet plumage of a hen grouse. (He reminds us that the double gun is unloaded, and to do likewise.)



Improved Deer Habitat Through Forestry

by Michael H. Seamster
Caswell and Western Areas Forester
Photos by Jim Dean

EVERY deer hunter dreams of someday killing a monster white-tailed deer with a rack on his head the size of a small rocking chair. But such deer don't grow on trees, or do they? Actually, trees do make a difference—in some cases all the difference in the world. If a forest doesn't provide ideal deer habitat, it won't grow big deer. In fact, it might not grow any deer at all.

Fortunately, wildlife biologists and trained foresters know what kind of habitat is best for growing big deer. Better yet, by using proper management techniques, it is possible to improve both the size and quality of deer herds and still provide for the necessary harvest of timber. This is what is being done on Commission-owned Game Lands.

If timber cuttings are made with wildlife requirements in mind, there will be a definite enhancement of wildlife habitat for some species, particularly deer. At least 90 percent of the forest manipulations needed for wildlife can be achieved through a well-planned cutting program.

Food

The white-tailed deer's diet is chiefly tender shoots, twigs, and leaves, a wide assortment of herbaceous foodstuffs, mast and certain fruits. Browse, by far, makes up the bulk of a deer's diet. Therefore, the ability of a given area to support a healthy deer herd is determined largely by the average amount of preferred and available browse. Food, more often than water and cover, is the limiting factor. An adult 100-pound deer requires four to five pounds of food daily. The range should contain a variety of plants that will provide a year-round food supply within the herd's home territory of slightly more than a square mile. For practical management as deer range, forests must produce annually at least 350 pounds of available forage per acre. Of this amount at least 20 percent should be available during the winter. Availability of adequate food supplies throughout the year is critical. Abundance of summer foods will not offset winter shortages.

Also, the condition of the plant influences its use by deer. Browse on slow-growing, suppressed stems is tougher and less palatable than on fast-growing sprouts. Thrifty plants can withstand repeated browsing and still renew foliage; whereas stunted plants are rarely able to extend new growth once they are browsed. Browse higher than five feet is unavailable to foraging deer.

The amount of food produced, and therefore the size of the deer population, is governed by the timber stand density, frequency of timber cuttings, size and distribution of cutting units, and application of prescribed burning. The timber is usually grown under even-aged management with understory species such as green-briars, hawthorns, flowering dogwoods, hollies, yellow jessamine, honeysuckle, and American beautyberry providing most of the deer food. Legumes, panic grasses, and mushrooms are also important deer foods produced. Even-aged management constitutes growing timber in stands that have definite beginnings and ends. They begin by planting, seeding, or by sprouts and end usually by clearcutting or by seed tree cuts.

Timber Stand Density

Timber stand density and forage production are inversely related. The denser the stand the scarcer the forage. A timber stand supporting 90 square feet or more of basal area per acre is likely to be poor deer range, whereas stand densities of about 60 square feet of basal area per acre would be of maximum benefit to deer. A stocking of approximately 70 to 80 square feet of basal area per acre would be a suitable compromise for both good deer habitat and good timber

A cutting unit of 50 acres or less is a recommended compromise. Regeneration of various deer food plants (left) is usually fairly rapid. Closed logging roads (right) are seeded with a mixture of fescue and clover.

production. During thinning operations on the Caswell Game Land, we try to thin stands back to 70 square feet of basal area per acre or less. The deer population on Caswell Game Land is definitely on the increase.

Considerable control over timber stocking can be exerted at the harvesting and regeneration phases of the rotation. In plantations, wide spacings, such as 10 x 12 feet, are more favorable for deer than close spacings. Forage production is very high until the crowns close. At close spacings, such as 4 x 6 feet or 6 x 6 feet, the canopy closes very quickly. A spacing of about 8 x 10 feet would be a suitable compromise between timber production and deer habitat.

In natural regeneration, the number and distribution of seed trees can be regulated to control the spacing. If too many seedlings still appear, precommercial thinning may be possible.

When a stand has reached a harvestable size, it can be thinned to provide growing space for deer browse, without lowering its wood-producing potential. If stand density is maintained at 70 square feet of basal area per acre by thinning the trees, a greater amount of deer browse can be expected throughout the rotation. To be of optimum value to deer, thinnings should be made every four to five years, but thinnings on eight-year intervals would be a suitable compromise for the timber producer.

In short pulpwood rotations where there are few thinnings or none at all, deer habitat will be poor for most of the rotation. Repeated thinnings are a common practice in sawtimber rotations of 60 years or longer. Deer benefit from these thinnings and this practice produces good quality timber. For this reason, long sawtimber rotations have been set up on Wildlife Commission-owned Game Lands.

Size and Distribution of Cutting Units

Managers of large forests usually prefer to clearcut large units, whereas deer benefit most when the units are small. A cutting unit of 50 acres or less is a recommended compromise. It will produce enough timber and accommodate modern machinery while still being small enough to provide adequate forest edge and numerous openings. Long, narrow irregular shaped clearcuts should be favored over square or circular cleacuts because they produce greater edge and are therefore more beneficial to deer. On the Coastal and Sandhills areas where the land is flat and the timber stands are large, 50-acre clearcuts are acceptable. On the rolling hills of Caswell Game Land where timber stands are small, our clearcuts are kept under 25 acres. At the present time we are considering making some five- to ten-acre wildlife clearcuts on Thurmond Chatham Game Land where the deer population is extremely high and the deer need the browse.

The greatest quantity of deer browse is found in these newly created openings. If these units are distributed over the forest, the deer will have a diversity of food and cover within their home range.

Prescribed Burning

Prescribed burning is useful both in timber management and in deer management. Prescribed burning involves running a controlled ground fire through an area to achieve the desired results. Foresters use prescribed burning to reduce logging slash, facilitate planting or seeding of trees, ease the movement of men and machinery, lessen the hazard of wildfire, control diseases, and restrict the growth of unwanted vegetation.

Prescribed burning also has an immediate and beneficial effect on the quantity and quality of herbaceous vegetation. Winter burns every three to five years will keep the browse within reach of the deer and seldom kill the crop trees or endanger wildlife. If given a choice, deer forage more heavily in burned woods than in unburned woods.

Most of the prescribed burning is being done on the Coastal and Sandhills areas. Much burning is carried out on Holly Shelter Game Land strictly for deer habitat improvement. Fire has been used sparingly on Caswell Game Land and its use will continue on selected sites. We have not been burning in the mountainous areas because of insufficient access to control fires.

One of the complaints often heard about forest management as it is now practiced concerns conversion from hardwoods to pine. Be assured that on Commission-owned Game Lands, hardwood areas that are beneficial to wildlife are being protected from conversion. And on some areas, such as Caswell Game Land, where we have many more acres of pine than hardwood, some pine areas are being converted to hardwood.

So the next time you are on a Commission-owned Game Land and see a timber harvest operation in progress, stop a minute to think. Sure, some operations look ugly and devastating, but remember, it is not an unplanned timber cutting. It is a well-planned timber harvest that will benefit wildlife habitat. That very timber harvest may provide the browse that helps grow your buck to a sizable trophy. ⬍

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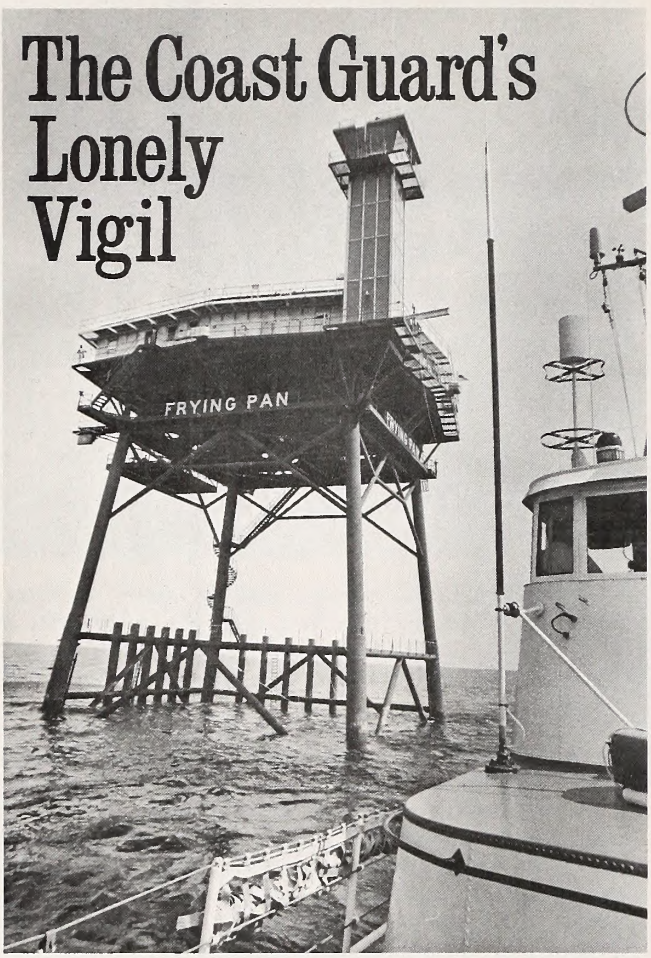
The Coast Guard's Lonely Vigil



by Jim Lasley
Burlington
Photos by Tony Rumple

THE skipper of the Coast Guard cutter Point Martin eased his bow toward the Frying Pan Shoals Light Tower.

A knot-and-a half current and one-foot swells pushed the 82-foot cutter toward the steel legs of the tower, but the skipper kept her under control with a delicate hand on the throttle of twin diesel engines.

Eighty feet above four Coast Guardsmen who man the light tower waited on a catwalk to lower a cone-shaped landing net to the cutter's bow.

It was shortly after 10 a.m. on a clear summer day, and the Point Martin, out of Wrightsville Beach Coast Guard Station, had been at sea for a little more than three hours.

The cutter makes this southward run of 43 miles every two weeks to deliver supplies and a relief crew to the tower.

It's a delicate maneuver, snaring the net from the bobbing deck, especially when the seas are running high. The only accident has been when the Point Martin kissed one of the tower legs, putting a slight bubble in her hull.

The Coasties, as the Coast Guardsmen are often called, have managed to make the lunge from deck to net safely. One veteran who is serving his second two-year hitch on the tower remembers when the exchange was made by rope Tarzan style by swinging from deck to a water level catwalk. He thinks that was the safer way.

But now the net is approaching and the skipper is jockeying the Point Martin closer. On the deck the Coasties, bundled in orange life jackets, turn serious as the net hovers a foot away.

"Go," the chief shouts, and two members of the boarding party lunge for the net and are instantly hoisted away, the cone net twirling because the snaremen held on too long as the cutter backed away.

"Don't look down," one of the Coasties yells. "It's like riding a ferris wheel; your stomach feels like it's turning over."

Below is blue and green water, 47 feet deep and clear enough to see the barracuda cutting back and forth through the swells.

On top of the tower which is known as a Texas Tower the Coasties live in a one-story deckhouse large enough for landing a helicopter and supporting a light tower that resembles an airport control tower.

The four legs of the tower are filled with concrete and sunk 100 feet in the sand. It is 115 feet from the water to the light.

Twin lights atop the tower rotate through the night, shooting signals miles across the ocean to warn sailors of the dangerous shoals which run as shallow as three or four feet along a strip a mile to a mile and a half wide. The shoals begin near the mouth of the Cape Fear River and extend for 25 miles to sea.

The four Coasties on the tower are responsible for the working order of the light. They also maintain radio equipment which flashes a continuous beacon to ships as a navigation aid.

Sailors far out at sea hone in on the radio beacon and set their ship on automatic pilot on a course for the light tower. Most ships headed for the Cape Fear pass the tower.

Each of the Coasties pulls an eight-hour watch every 24-hours. They broadcast the weather at three-hour intervals to the mainland, scrape rust and paint and do general housekeeping duties.

Each has his own room and there's a large day-room with easy chairs, pool tables, ping pong table, television and stereo equipment.

If they couldn't see water on all sides they'd hardly know they were far from land. Occasionally the tower sways with the wind and when the swells are running high it sounds like a freight train is rumbling through below.

Off watch the men usually fish to pass the time and forget their loneliness. But after a while some say they tire of catching fish. That is why one's only fishing goal is a big shark at least 20 feet long.

For 28 days at a stretch the Coasties work and fish. Then it's liberty and 14 days ashore.

"You get pretty lonely sometimes," said Frank Divinie of Reidsville. "Nobody really wants to go back but you have to . . ."

James Chedister builds model cars and is paint-

Crewmen on the Frying Pan tower (above) wait to hoist cargo as the Coast Guard Cutter Point Martin approaches. Enough supplies are kept on the tower for weeks during bad weather. The transfer from the tower to cutter is a delicate maneuver (below) because of the bobbing deck.

J. A. Stimatz, U. S. Coast Guard Academy graduate, skippers the Point Martin which ferries supplies and crewmen to the Frying Pan Shoals Light Tower every two weeks. The cutter also runs extended offshore rescue missions.

ing a mural of the War of 1812 on the dayroom wall to pass the time, but fishing is his love.

"We catch 'em from two feet to 14 feet, about any kind you can think of," he said. "If you don't get a bite every 10 seconds you're out of bait. Blues will bite anything. There were thousands and thousands of them last winter as far as you could see on the horizon."

Chedister, who is single, loves the Coast Guard. He joined up when he was 17 and has been in for 13 years. He grew up on Long Island Sound watching the Coast Guard in action and wanted to be a part of it.

"I've been on Frying Pan Shoals about a year," he said. "I like getting off by myself. I like the solitude; I like getting away."

He describes his life on the tower as like living inside a giant aquarium, where "you see something different every day."

Chedister and his shipmates are carrying on a tradition that began 110 years ago when a lightship was first anchored on the shoals as a warning to sailors.

The last lightship drew anchor in 1964 when the tower was built.

Arthur Huntly, a retired Coast Guardsman who lives in Southport, was skipper aboard that last ship, and forever notched in his memory are the day and night he and his crew rode out Hurricane Hazel in 1954.

"It was a hell of a rough time but it was our job to keep the lights going," he said. "It started slow and lasted for a long time. It seemed like forever."

He remembers curling his fingers around a brass railing in the wheelhouse and watching wave after wave curl up over the bow and break aft over the radio shack, but the ship stayed together.

Now the four Coasties on the tower can be plucked away by helicopter when there is a threat of a hurricane, leaving the lights and radio beacon to function by sophisticated electronics.

The helicopter can make the land-to-tower trip in 20 minutes. It takes the cutter three hours. The Coast Guard prefers the sea route; it's the way they've been traveling since 1790. ⬍

Carolina Cougar: An Update

SEEING deer is no rarity along the Cataloochee River in the North Carolina portion of the Great Smoky Mountains National Park. In fact, deer are nearly as common as sparrows in that area. But these deer, a large doe and two yearlings which were being observed by five park employees, were behaving oddly.

The men, Lee Cochran, Ernest Wiggins, Horace Cunningham, Walter Laws and Jesse Elliot Jr., all of Bryson City, North Carolina, were sitting on the front porch of a bunkhouse. They had been working in the remote section of the park for over a week and, as they usually did when the supper dishes had been cleared away, had retired to the porch to talk and watch the deer which frequented the area. This was the best part of the men's day and the porch afforded them a pleasant view of the surrounding valley. Just opposite them, across a gravel road, was an old barn where Ranger Jim Waldrop stabled two patrol horses. Fifty or so yards down the road from this barn was an old farmhouse which had been converted to a ranger station. Below this ranger station, the road was bordered on both sides by long, narrow meadows. And off to the right, pinched between one meadow and a steep, timbered ridge, was the Cataloochee River. As the five men sat talking, they could hear it clattering over stones in the background. This was July 23rd, 1975. An altogether typical evening in the quiet Cataloochee Valley—except for the strange behavior of those deer.

"At first, we thought they were just playing," reported Horace Cunningham. "But then, the more we watched them the more we could see that something was bothering them."

According to Cunningham and the others, the deer were in the meadow to the right of the road and appeared extremely agitated. Their tails switched constantly and when they dipped their heads to browse, they abruptly jerked them up again. Finally, heeding some mutual signal, they simultaneously bolted for the meadow to the left of the road. But after several darting bounds, they halted as abruptly as they had fled. Then, with ears perked and tails switching, they slowly milled their way back across the road and into the meadow from which they had fled. A minute or two elapsed; and then they bolted again. Only this time their exit was not so organized. The doe and a yearling headed to the right, towards the river, and the lone remaining yearling headed back to the left, away from it.

Unable now to constrain his curiosity, Walter Laws left the porch and stepped into the middle of the road. The deer were nowhere in sight. Still puzzled, Laws remained in the road. A park service truck came rolling up; hellos were exchanged and the truck moved away. By now it was late dusk and Laws was watching the truck's red tail lights disappear around a curve beyond the meadows when, between him and the truck and coming from the river, an animal cleared the road in a single arcing bound. "Look at that black deer," he shouted.

From the porch, Ernest Wiggins shouted, "Black deer my foot. Not with a tail like that!"

And that's the way it usually happens. A fleeting, unexpected glimpse that momentarily startles the mind. Then snap, an image is developed and a man knows, without a doubt, that he has seen a mountain lion. Only in this particular instance not one, but five men saw and simultaneously identified the animal which is known as mountain lion, cougar, panther, catamount or puma. Moreover, the men had the rare privilege of seeing more than a glimpse, for as the cat sprinted through the field, they were able to follow it for several seconds.

A truck was excitedly turned around and pointed towards the meadow. Periodically its high beams were switched on, illuminating the meadow and bordering woods in a pale glow. But the cat was not seen again. Even so, something of its presence remained. For that night, Jim Waldrop's horses were unusually skittish. According to Horace Cunningham, "They snorted and blew all night long." No one could recall a night when the horses had been so vocal for so long. The next morning, round clawless pad marks were found on the edge of the road. According to general consensus they were, "a little smaller than a man's palm." And a week or so later it was noticed that only the doe and one yearling were making their regular twilight appearance in the meadows. The mountain lion, which had momentarily lost its shyness and shown itself in what was certainly an abortive stalk, had apparently made a kill.

Because five men saw the big cat at the same time and identified it as a mountain lion, park officials released a press report describing the incident. This report was picked up by the various news media and all over the southeast people were informed that the

by Stewart Hardison
painting by Lee Cable
Photos by Leonard Lee Rue III
and Denise Hendershot

existence of the eastern mountain lion, which was officially considered to have been extinct outside of Florida for nearly a hundred years, had at last been proven. Park officials were deluged with inquiries and the five witnesses hounded for interviews. Launched to near celebrity status, the five were nevertheless bewildered by all the fanfare. Not that seeing a cougar is a routine kind of thing, but because they are convinced (as are some park officials) that the big cats have been in the Smoky region all along; and that their sighting, however lucky, is therefore not of extraordinary significance.

All of the men are Smoky Mountains natives and have roamed the region since boyhood. Walter Laws, for example, grew up on Noland Creek and hunted and fished the high Smokies as a boy. This was before the park had been created; and before the waters of Fontana Lake had isolated his home valley. "My people were some of the first to settle this region," he reports. "And they were all hunters. Believe me, there was never a doubt in anyone's mind that there were always panthers out there."

Laws can recall boyhood occasions when he would be playing in his yard and hear a scream, "that would send chills up my legs. I'd squall and try to mimic it and sometimes it would squall right back. Whatever it was it wasn't a bobcat and it wasn't an owl. I think it had to be a panther."

Although Laws cannot actually prove that what he heard was a mountain lion, skeptics should pause to remember that a mountain lion's scream is almost always compared to a woman screaming in some state of distress or hysteria. Consequently, it stands to reason that if a cougar is going to answer any human, a plausible candidate might well be a young boy, whose screaming voice is similar to a screaming woman's—or mountain lion's.

Though Lee Cochran and Emmet Wiggins have never had a mountain lion answer them, they too have always believed that the animals were never extinct in the region. "There have always been a lot of bobcats around," reports Wiggins. "You see their tracks everywhere, so we know what a cat track looks like. And I've seen one which was too big to have been made by a bobcat." This particular track was discovered by Wiggins high on Hyatt Ridge near the Mount LeConte section of the park. It was winter, 1973, and the track was imprinted in fresh snow. According to Wiggins, the pad was three and a half to four inches across.

Cochran is especially bemused by the media flap, because he has seen a mountain lion once before. This sighting occurred ten or 12 years ago as he was driving at night near the Alarka community. Rounding a sharp curve, he came upon a large cat like creature crouched on the shoulder of the road. The headlights from Cochran's truck momentarily confused the animal and this enabled him to drive within 20 or 40 feet of it. The animal was yellow in color and appeared to be about three and a half feet long with a tail nearly as long as its body. According to Cochran, "the tail carried a curve in it." Cochran immediately returned home and summoned friends. With trained hounds, they returned to the place of sighting. After some hesitation, the hounds began to trail. But they were not enthusiastic and after a short chase the men returned home.

While the Smoky sighting has garnered the most attention, there have been responsible sightings in other southern Appalachian areas as well. One of these was reported this past summer out of Tazewell, in the southwestern corner of Virginia. In this particular incident, the initial sighting was made by a sheep rancher-businessman, Albert Gillespie, as he was driving to meet two employes. From his car, Gillespie saw a large yellow animal ambling across a pastured hillside several hundred yards off the highway. Dumbfounded, he braked sharply and pulled onto the shoulder. As his car left the pavement, a tire squealed. Hearing this sound, the animal stopped and looked down at him. The two men Gillespie was to meet were 50 or so yards away and when he told them what he had seen and pointed to the hillside, he was greeted with profane sarcasm. But the two men looked and then, in collective amazement, the three of them watched as the animal trotted across the pasture and disappeared into a brushy ravine. The size of the animal and the great long tail left no doubt in their minds that they had seen a mountain lion. Several days later and a quarter mile away, one of the men,

The mountain lion or cougar is an extremely shy and secretive animal and even where it is relatively abundant, is seldom seen. Note the very long, heavy tail.

PHOTOS BY LEONARD LEE RUE III

This is the right front foot of a mountain lion. The tracks are distinctive, but unless made in soft earth or mud, may be mistaken for other large animals.

PHOTO BY DENISE HENDERSHOT

This month-old mountain lion kitten is distinctively marked and has the characteristic blue-gray eyes of all young cougars.

George Williams, flushed a large cat out of a meadow as he approached on a tractor. This was a bright sunny day and Williams was close enough to see the black tip on the cat's tail. Followed by two kittens, the animal casually stepped a fence post and pounced to the other side. The kittens, about the size of a large spaniel dog, went under the fence. Initially frightened, Williams now regards the incident with reverential awe. "She was the most beautiful animal I ever saw," he reports. "And those kittens . . . I'll never forget it as long as I live.

However responsible and detailed a particular sighting may be, persons of skeptical persuasion will undoubtedly demand something more, something in the way of physical evidence. Those persons will be reassured to know that such evidence does exist. In recent years Dr. Fred Barkalow, a zoologist at North Carolina State University, has analyzed various animal hair samples taken within the state. The analyses were made with a scanning microscope and two of the test samples appear positively to be mountain lion hair. Each sample is light brown in color and each, surprisingly, came from the southern piedmont section of the state. One was taken from a barbed wire fence near Badin Lake, on the Pee Dee River, following reports of mountain lion in that area. The other was taken from an oak tree near Lake Norman, on the Catawba River. This particular sample was found six to seven feet up the oak tree, which also had scratch marks on it at that height.

Though these cougars may be considered North Carolina cats, Barkalow strongly suspects that they are migrants from the Carolina lowlands or even Florida. This assumption is based on the solitary, nomadic nature of the mountain lion and the fact that many swamp areas suitable for the animal have been drained in recent years.

That the mountain lion will use a major river drainage system to travel great distances seems further indicated by the fact that one was actually shot from a tree and killed, in 1942, in the TVA lakes region of northern Alabama. According to Dr. Barkalow, this specimen was light brown in color and weighed 109 pounds. Although this mountain lion was discovered some 200 odd miles down river from the Great Smoky Mountains, it was killed the same year that construction was started on the TVA's Fontana Dam. According to men who worked on the project, several panthers were flushed from a rock cliff area along the Little Tennessee River during the early construction and timber clearing period. Considering such circumstance, there is a real possibility that the Alabama mountain lion was actually a displaced migrant from the Great Smoky Mountains of North Carolina.

That mountain lions have been with us these many years and have managed to elude the notice of expert woodsmen and hordes of outdoor recreationalists alike, seems somewhat incredible. Yet, if one considers the true "nature of the beast," it is perhaps less remarkable. At the time of Columbus, mountain lions ranged over the entire western hemisphere—from the Atlantic to the Pacific throughout North and South America; north to the Yukon Territory of Canada and south to the blustery Straits of Magellan. There are now huge holes in this original range, but they still do occur from ocean to ocean and from near Arctic to near Antarctic latitudes. They are even found in the sultry Amazon basin. Perhaps no other land mammal in the world is so widespread, so to say that the mountain lion is adaptive is risking an understatement bordering on the absurd. But such is the resilient character of the animal and, along with its brilliant shyness this adaptive prowess has enabled it to survive within the very suburbs of civilization.

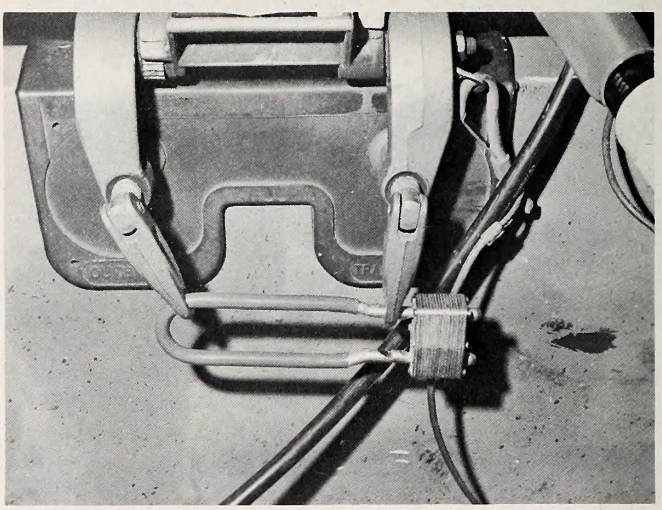
About half the size of the African lion, the mountain lion still has the necessary bulk and strength to bring down a large deer or occasional elk. But if the larger game is scarce, it can make do on rabbits, mice, frogs or even grasshoppers and carrion. Solitary in nature, the mountain lion is a roamer and a night's ramble of 25 miles in search of food is routine. But if food remains scarce or its habitat destroyed, it is capable of a much longer, more prolonged odyssey. Even the animal's coat has helped it survive, for unlike the leopard, jaguar and other spotted cats, the mountain lion has never been mercilessly hunted for its pelt. Generally, its pelt ranges from tawny to gray. The tail is black tipped and the underbody is white, as are the insides of the legs.

While legend has it that some mountain lions are pure black, experts generally concede that no such color phasing exists—or has yet to be proven. This "black panther" legend is a persistent one, however, and perhaps originated in pre-colonial times when most sightings occurred in gloomy light under the shading canopy of virgin timber. This lighting factor, along with the fact that an early Daniel Boone type undoubtedly considered the animal dangerous, may well have seeded the black panther myth. (Walter Laws remember, under similar poor lighting conditions, momentarily thought he had seen a "black" deer.)

The survival of the mountain lion in North Carolina (and no doubt other eastern states as well) is a remarkable and happy story indeed. Admittedly, they must rank among the rarest animals in the state and for this reason are protected by law. Yet however rare and seldom seen they might be, the very knowledge that they are still with us is an encouraging, even inspiring sign for these environmentally troubled times. For as much as any other animal, the mountain lion epitomizes the idea of wilderness. And though there is scarcely any wilderness left in the state, merely knowing that a mountain lion might inhabit a particular range of mountains or remote swamp is enough to alter the character of those places. They are enhanced. Somehow, the mountains become a little wilder, the swamp a little more mysterious. And for that we are all the richer.

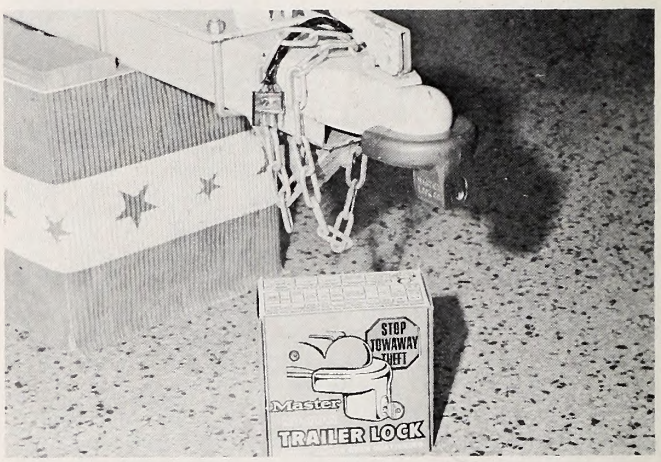
Stem to Stern

BY ED JENKINS



Boat thieves look for easy targets. A good lock may be enough to cause the boat thief to pass up your craft. One type of motor lock is shown above; trailer type below.

PHOTOS BY JOHN R. PARKER, JR.



• One of the worst experiences a boat owner can have is to go out one day to use his boat only to find the boat and/or motor has been stolen. Although having suffered this experience 15 years ago, I still remember the sick feeling in my stomach I felt when I saw the vacant space on the transom of my boat where my small Mercury outboard used to ride.

Boat thefts are on the increase. Boats are becoming more expensive, more numerous, and more tempting to steal. Claims against some insurance companies for boat thefts are said to be increasing 20 percent annually.

No longer is it a problem of a joyriding teenager who only intends to borrow the boat for a ride then leave the boat abandoned. Professional boat thieves are finding a lucrative market dealing in stolen boats and motors.

At the National Association of State Boating Law Administrators Conference held recently in Chicago, state boating authorities were told of the alarming number of boat thefts occurring each year. In one case reported where an individual was arrested for dealing in stolen boats, it was found this person would visit marinas or mooring areas and would make tape recordings on a small pocket tape recorder of the description of every boat in that area carefully detailing location and security measures used to protect the boat. When he received a "customer order", he would refer to his tapes until he located a boat similar to the one his client wanted. Noting the security measures described on the tape, he was able to steal the boat with little trouble. By using a phony bill of sale to obtain a new boat number, he would later present the stolen boat complete with valid registration to the buyer.

Stolen boats and motors have been extremely hard for law enforcement officials to identify. Boats have been painted, motors switched, and even seemingly legal registration certificates or titles issued. Until the passage of the Federal Boat Safety Act of 1971, boat manufacturers were not required to put hull identification numbers on their boats making identification even more difficult. In many cases, owners of boats that were stolen have failed to record the motor and boat identification numbers.

No boat is completely theft proof, but there are many precautions boat owners can take that will discourage even the most persistent boat thief.

• Always remove the key from the ignition. Sounds pretty basic, but thousands of boats are stolen each year because someone issued the key-in-the-lock invitation.

• When parking a trailered boat, remove a wheel or attach a trailer hitch lock. That way you aren't providing ready transportation for towing it away.

• Use a steel cable or chain, with lock, to tie up with . . . and be sure you secure them when leaving the boat. A vinyl-coated chain will protect the boat finish and keep the chain from corroding.

• Be sure your boat is left only at an attended dock and one which is lighted at night.

• If you keep your boat in a garage, be sure the garage door is closed . . . and locked.

• Install an alarm wired to the ignition or a dual ignition switch.

• As an extra precaution, hide a second set of identification numbers such as your social security number somewhere on the boat. That way, if it is stolen, you can prove ownership even if the thief has removed the manufacturers hull identification number.

• Items such as compasses, radios, binoculars, depth finders, and other expensive gear should be removed from the boat or locked up before leaving the boat.

• Small clamp-on outboard motors should be locked to the boat in some manner.

If your boat is not kept at home or locked in a garage, check on it frequently during the winter. While this may not keep it from being stolen, early knowledge of the theft may assist law enforcement officers with recovery.

Are You Overlooking ULTRA-LIGHT?

FISHING

THE first ultra-light spinning rod I ever saw was a five-foot whippy noodle that seemed more like a toy than a practical fishing tool. The reel was tiny and the line tested a mere two pounds. The man who owned this outfit said it would revolutionize fishing.

That was over 10 years ago, as I recall. Indeed, for a few years, ultra-light spinning tackle created quite a sensation and its development has unquestionably influenced fishing tackle design.

But ultra-light spinning tackle certainly has not revolutionized fishing, at least not for most anglers in the Tarheel State. During its first surge of success, the afficionados of ultra-light predicted that they would even replace fly fishing in both fish catching ability and delicacy. Time has proven this untrue.

Ultra-light tackle is still made and is widely available, but very few fishermen use the super light gear as it was originaly designed. In fact, in this part of the country, it is almost impossible to find one and two-pound test monofilament. Four-pound test mono is widely available, and this is what most ultra-light enthusiasts use. Actually, four-pound test line is at the upper limits of true ultra-light tackle. Those who use six-pound test, thinking they're fishing true ultra-light spinning tackle, are actually fishing pretty heavy stuff.

Most of the serious fishermen I know have at least one ultra-light spinning outfit which they use mostly for panfish, trout or shad. This kind of tackle is ideal for these fish.

An ultra-light outfit with four-pound test line is excellent for throwing those tiny rubber-bodied spinner baits and tiny Mepps spinners which are so deadly for bluegills, crappie and other panfish. Up in the hills, the same lures are excellent for trout where they're legal.

Some anglers believe that ultra-light is at its best during the spring shad runs. I know of few sports more exciting than catching one to two-pound hickory shad on darts and spoons using light rods and four-pound test line. Even the larger American shad are fair game for ultra-light, although fewer fishermen use it since American shad average three pounds. However, shad over five pounds can be handled easily by ultra-light.

But what about ultra-light for other species—fish like the largemouth bass and chain pickerel? I think ultra-light is often overlooked as a basic tool for these, and many other, species.

For example, in the lakes and ponds I often fish, standard-sized casting or spinning plugs are simply too big to be effective at times. On a windless day, a topwater plug hits the water with all the delicacy of a brick. Large weighted plastic worms may also spook fish in hard-fished lakes or small ponds. Yet, tiny plugs and worms thrown with ultra-light spinning gear on four-pound test line are unlikely to frighten fish.

During the past year, I've been carrying an ultra-light spinning rod along on bass and pickerel fishing trips. When the fish refuse to take large plugs and worms, I often switch to ultra-light. Almost invariably, the action picks up, and I can only assume that the bigger baits I'd been using were either spooking fish or were too large to attract any attention.

True, I catch more small bass and pickerel using ultra-light, but even small fish are fun on these rods. Furthermore, I've learned that large bass and pickerel will take small lures and worms.

I've seen bass over five pounds landed using ultra-light spinning tackle, although I haven't been fortunate enough to hook a real whopper yet. However, I've had a heck of a lot of fun catching big chain pickerel on ultra-light.

On one recent trip, I took pickerel up to three and a half pounds using a two-inch Rapala minnow and four-pound test line. Before I switched successfully to ultra-light, I fished for several hours using heavy casting tackle. I didn't even get a strike using large plugs, but as soon as I switched to ultra-light, I began to catch fish.

There is one obvious disadvantage to ultra-light spinning tackle. You tend to lose more fish, especially if you're fishing in thick cover. But I'd rather lose a five-pounder than never hook him. Besides, if you play a fish cautiously, you can land a whopper on light line. I've seen 20 pound king mackerel landed on six-pound test.

If you've never tried your ultra-light gear for bass, pickerel or other similar fish, by all means give it a try. I think you may be in for a pleasant surprise.

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

Gaddy's Closed

Gaddy's goose refuge, a popular meeting place for wild waterfowl and their admirers for many years, is now closed to the public. Thomas Pond, heir to and manager of the private refuge near Ansonville, related that the number of geese returning to the pond has steadily decreased in recent years as the birds stop over in more northerly states. The refuge will be closed to the public this winter but hopes are that the number of geese returning to the area will increase in the future and justify reopening the refuge to the public.

Wildlife Commissioner Nominations

A public meeting will be held at 7:30 p.m., January 13, 1976 in Southern High School, Alamance Co., for the purpose of selecting nominees from which the Governor will appoint the Wildlife Commissioner for Wildlife District No. 5 (Alamance, Caswell, Chatham, Durham, Granville, Guilford, Lee, Orange, Person, Randolph and Rockingham counties) to fill the unexpired term of Jay Waggoner, deceased, which ends June 30, 1977.

Bob Milstead Dies

Friends, associates and sportsmen across the state were saddened by the untimely death of Robert (Bob) Milstead, Commission warehouse manager, on November 6. Bob joined the Commission in July of 1951 as a wildlife protector in the China Grove area of Rowan County. He became one of the Commission's airplane pilots in 1962, was the pilot's supervisor from 1964 to 1966 and served as an active pilot until failing health grounded him in 1968. He had served as manager of the Commission's warehouse from 1968 until his death.

Pollution Help Line Busy

From January through October better than 300 calls were placed to North Carolina's Pollution Help Line 1-800-662-7308. Citizens calling this number have their questions answered or are referred to specific divisions and sections of the Department of Natural and Economic Resources for a response.

Motorboat Owners Take Note

Effective Jan. 1, 1976, all motorboats used on public waters of N. C. are required to be numbered. Do it early and check page 18, January "Wildlife" for details.

WOOD DUCK WEST!

Waterfowl Banding Shows Thar's Ducks in Them Hills!

by Park Peterson, Keith Robertson, Rod McClanahan
Wildlife Management Technicians

THE mention of duck hunting almost always bring to mind images of salt marshes and steely water whipped by a brisk northeaster and a spattering of sleet. The ducks come in low and fast, and you get two quick shots before the flock is gone, hidden by the icy mist. Those are the images of Currituck and Mattamuskeet; the eastern tradition of waterfowling.

Very few duck hunters associate their sport with high mountains and dense forests, or rivers flowing through hills tinged with the first colors of fall. You don't think of shooting ducks in the mountains of western North Carolina. Waterfowl and mountains just don't seem to fit.

This was precisely the sentiment of many North Carolina Wildlife Resources Commission field personnel when guidelines were established for the wildlife management crews of the western Game Lands to trap and band wood ducks. Western wildlife management crews have in the past years been primarily concerned with activities such as habitat improvement, management and restoration of forest game species, both big game and small game.

But last year, western Game Land crews, became involved in wood duck trapping and banding in addition to their normal activities. As one would expect, the idea of trapping and banding waterfowl was entirely new to the western crews. In fact, this year represents the first wide scale efforts to study the waterfowl resources of western North Carolina.

During the previous year, wildlife biologists conducted wood duck roost surveys to determine the locations of major wood duck concentrations. Trap sites were subsequently located in those areas where large concentrations of wood ducks were found to occur.

Two methods were used in capturing wood ducks—wire funnel traps and rocket netting. Wire funnel traps function by luring ducks into a wire enclosure through a funnel passage in search of bait. Once in the trap, they are unable to locate the funnel exit and are captured. Rocket netting consists of firing a nylon net over feeding birds by means of propelled rockets. The rockets are loaded with a black powder charge and are ignited by an electrical charge produced by a 12-volt battery. Both methods used to trap wood ducks are similar to those used by waterfowl workers in other areas and proved to be rather productive in the mountainous type habitat. Through the use of both trapping methods, western wildlife personnel were able to far surpass their established quota.

Trapped wood ducks are marked with aluminum leg bands which have an identification number and address to which the band should be returned. You can help your sport by returning any band you recover.

Photo By Darins Robertson

The completion of this year's trapping and banding activities represents the first in an extensive, statewide, five-year wood duck banding program initiated by the N. C. Wildlife Resources Commission. Results of past waterfowl hunting seasons have indicated that the wood duck is the most important waterfowl species to North Carolina waterfowl hunters, comprising approximately 30 percent of the state's waterfowl harvest. Biologists seem to believe though that a substantial percentage of the wook ducks produced in North Carolina have already departed for the warmer climate of more southerly states by the time the waterfowl season opens.

This year the Wildlife Commission again chose a split waterfowl season. The first segment was open October 1-4. This early split season was designed to allow North Carolina waterfowl hunters the opportunity to harvest these early migrants, and it was a success. The North Carolina Wildlife Resources Commission is hopeful that the statewide wood duck banding program in conjunction with harvest data gained during the waterfowl season, will provide the information that will enable biologists to better understand the migratory habits and migrational patterns of wood ducks.

The Wildlife Commission would appreciate the cooperation of all waterfowl hunters in reporting the recovery date, location, and band number from all wood ducks harvested which have an aluminum numbered leg band. Such information will enable the N. C. Wildlife Resources Commission to continue to establish waterfowl hunting seasons, based on sound biological facts, that best comply with the desires of North Carolina waterfowl hunters.

Summertime Hikers

Sunshine Campers

by Robert L. (Rip) Collins
Blowing Rock

TWO hundred years ago Thomas Paine, during the Revolutionary War, ridiculed the timid and faint of heart by branding them "summertime soldiers and sunshine patriots."

These taunting words may be sometimes whispered today in paraphrased scorn for summertime hikers and sunshine campers.

If you have not heard such epithets slyly flung at the Tenderfoot who shrinks at the thought of cold and cloudy weather it may be that the Backpackers you know are restrained from such abuse as much by selfishness as by good manners.

Mum is the word for a winter Backpacker who savors the solitude of the **off-season** trails. Like a fisherman protecting his favorite fishing hole or the hunter who does not reveal the location of wild game, a Backpacker may be very quiet about his wintertime sport.

Or, on the other hand, he may intentionally dwell upon miseries endured in the cold in order to discourage potential hikers from jamming his favorite winter trail.

Recently, I was in the company of a winter hiker who on the tide of enthusiasm had forgotten himself for the moment and was expounding to the group on the beauties of a winter trail when he suddenly caught himself. Tempering his enthusiasm in the middle of his tale he ended with a drab monologue on his last cold, wet miserable outing thus escaping the ignominity of promoting winter participants in his favorite sport.

Some of his listeners were quick to mark the story teller as a glutton for punishment who endured tribulations of winter trails to martyr himself.

"Poor Ole Charlie," they said after he had left our company. "He will go to any length to prove that he is a superjock Backpacker."

But being better acquainted with Charlie than the rest of the group, I could imagine him on his way home mopping his brow as castigating himself for almost spilling the beans.

It is a fact that many of my Backpacking friends do not even pick up their gear in the hot days of summer. It is only when cooler nights follow cool days that they take to the trail.

At this season bugs and vipers have disappeared and the chilled air adds vigor to backpacking. Overheating and perspiration are no longer problems and best of all the trails are not crowded.

Many faces of nature hidden by the green cover come into focus in colder weather and there is a crispness and activity which is missing on languid days of summer.

If winter trails free from confining foliage, crawling and flying pests and constant human traffic do not appeal to you, far be it from me to taunt you for being a sunshine camper and a summertime hiker. Some of my best friends are fairweather campers.

But, I must confess, like Charlie, my favorite backpacking season comes just after leaves fall and lasts until new leaves unfurl in the Spring.

When frost nips the land and squirrels scurry about planting trees there is a vigor in the world that heightens the pleasure of striding along on a quiet trail with long views now unobstructed by foliage.

Now, above you it is possible to see the red-tailed hawk making lazy circles in an azure sky. And the limbs stripped by brisk winds reveal the hornet's nest, cleverly concealed during the summer, it now hangs exposed like a huge inverted pear and you can walk directly underneath without threat from its dormant occupants.

Instead of a confining canopy, the leaves form a crunchy carpet beneath your feet and blend their richness with the aroma of the autumn or winter air.

And when you roll out your sleeping bag on the aromatic brown carpet you discover that you are directly under a thousand unhidden stars that wink brightly just beyond the tips of the tallest trees.

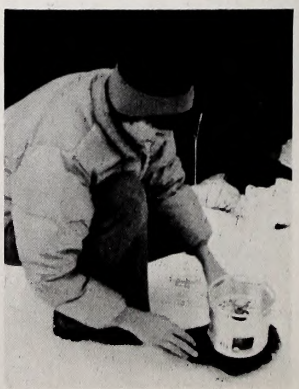
And later in the season, if you are lucky, you may spend the night in a snug tent and wake to the whisper of falling snow. As you look out you see a pristine new world in its dress of Ermine. Everything takes on a new perspective, and you may discover how easy it is to track the deer that passed by noiselessly in the dawn.

From nearby you may hear a jaunty wren flinging the challenge. . . . Can you, like him, meet the worst mother nature can dish out and be comfortable and happy? Not just to endure it . . . but to overcome it?

There is a sense of serenity and accomplishment . . . a new confidence experienced only by those who,

PHOTOS BY THE AUTHOR

Reliable camping gear is no place to cut cost corners. Get the best, lightest, most trouble-free that you can afford. Keep it in good condition and ready to go.



like the tiny bird, have pitted their strengths against the elements and won.

As you crunch homeward on the trackless snow you may find that you are warmed by a feeling of self-discovery and exhilaration you never experienced on a summer trek.

When winter begins to yield to Spring yet another aspect of nature presents itself to the backpacker.

Myriad trilliums, violets and bloodroots join the host of flowers racing to bloom before trees put on their new dress shutting out the sun from the floor of the forest.

Service berry, redbud and dogwood blossom and the turkey cock forgets to be so wary and struts mightily to impress his harem.

This is the season when song birds, newly arrived from the south, musically court mates and establish territories. The cardinal whistles from the tree top telling the world, and his mate, where he has taken his stand. The flashy male rose-breasted grosbeak warbles a song sweeter than a robin's and the summer tanager answers in kind.

The tuffed titmouse discovers its voice and persistently repeats its call as if mesmerized by the sound. From a resonant tree in the distance, the spectacular pileated woodpecker establishes his range more by drumming than by his wild cries which echo through the woods.

In a few short weeks these birds, and many others, will secrete themselves in the foliage and their songs will become increasingly subdued and infrequent.

By mid-summer the brilliant sights and sounds that fascinate the off-season backpacker will have all but disappeared. Days will be hot and nights so warm that the wood fire which was such a welcomed comfort to the winter hiker may not even be kindled.

Campgrounds will again be crowded and the throngs on the trails will, by their very numbers, frighten away the wildlife and trample the wildflowers which they came to see.

For years the backpackers out west have smiled in amusement at our Southern predilection to relegate backpacking to summer months.

In their abbreviated Alpine season they would find limited time for the sport. And anyway, some summer days at elevations twice the height of our Southern Appalachians may be as severe as any days that our winter months can offer.

Closer home our hunters, especially those who stalk deer and bear and those who huddle in blinds to wait for waterfowl, have managed all the elements the backpacker may encounter and found joy and excitement even when they returned empty-handed in the face of bad weather.

The truth is that with reasonable forethought and planning even a Tenderfoot can taste the fruits of "off season" backpacking.

Recent developments in backpacking equipment, such as the Dacron II Fiberfill sleeping bags, not only have made it easier to be properly equipped for cold weather, they have also made it less expensive.

This new man-made fiber by DuPont provides most of the compressibility, lightness and warmth of down for half of the expense of prime-goosedown. The secret is to get a well-constructed sleeping bag with no sewn-through seams.

A closed-cell foam pad, known as Ensolite can be used by even the most weight conscious hiker and it can be worth as much as 10 degrees in warmth on a cold night.

Lightweight, breathable nylon tents with separate waterproof flys not only are light and strong, but they also provide a double roof which traps dead-air helping to control inside temperatures without trapping moisture.

New developments in food and cooking gear make a hot, nourishing meal quick and easy to prepare.

Freeze-dried foods are light-weight and require little space for packing. Some of these foods were developed for use by the American astronauts and can be surprisingly tasty . . . considerably better than their dehydrated predecessors.

Chicken, turkey, steaks, chops and even shrimp cocktail are available either as separate entrees or in combinations of balanced meals. Most supermarkets now carry a line of prepared foods which are readily accessible and as easy to prepare. Coffee and cocoa now come in handy packets along with soups and one-dish meals such as macaroni and cheese.

Cooking simply requires boiling water. And a quart of water can be boiled within 8 minutes on several types of backpacking stoves some of which are imported from the mountaineering countries of Sweden and Austria. Newer, American designed stoves, which also may be safer, use bottled L.P. gas.

One of the new L.P. type stoves burns with an

Backpacking gear can be very basic and simple, or pretty "fancy." Weight is of prime importance and it may take a trip or two to round out your particular requirements. Short winter trips at first may be best, and will soon point out equipment gaps.

PHOTOS BY JIM LEE

infra-red ray rather than a flame which the wind might blow out and the stove is instantly and easily convertible from cook-stove to heater. Fuel and double-use stove weighs less than 32 ounces.

There have also been recent innovations and improvements in warm, lightweight clothing. One example is the "Fish-Net" underwear. Designed to trap warm air next to the body beneath outer garments this material has an open weave which permits moisture to evaporate, thus eliminating one of the problems of the heavier-closer knit "insulated" underwear.

Lightweight down-filled or Fiberfill II jackets are becoming increasingly popular because like fish-net underwear and down-filled sleeping bags they employ the principle of trapping warm air, yet they are lightweight and easy to pack.

Hunters and other outdoorsmen have known for a long time that the trick in dressing for severe weather is to use layers of clothing so that garments may be added or removed as required by activity or the outside temperature.

Adequate damp-protection for the head, body and feet is imperative, but it is important to guard against materials which are completely waterproof. Otherwise moisture is trapped next to the body making a hiker colder instead of warmer.

A light-weight, coated nylon jacket, a parka or a poncho serves well for this purpose. It is well to remember that a poncho lends itself to the principle of easy ventilation and this garment can double as an extra ground-cloth or even extra shelter in foul weather.

The head is the most effective radiator a person has. It should be uncovered during vigorous exercise to avoid sweating. Keep it covered to conserve body heat and to force warmth to the extremities.

This is so basic that one authority makes a facetious sounding suggestion. Gerry Cunningham says, "If your feet are cold, put your hat on."

Cold feet are a chronic problem for many people. In addition to keeping the hat on, the old remedy of keeping feet dry and encased in two pairs of socks—cotton inter and wool outer—continues to be good advice. New "wick" socks are also available which are designed to serve the purpose of two pairs of socks with a wicking action which takes the moisture away from the feet.

Leather should be treated with a preparation such as "Sno-seal" which will preserve the leather and protect against outside moisture.

Many summer backpackers already possess a goodly portion of the equipment and clothing necessary to make participation on a year around basis not only possible but also enjoyable.

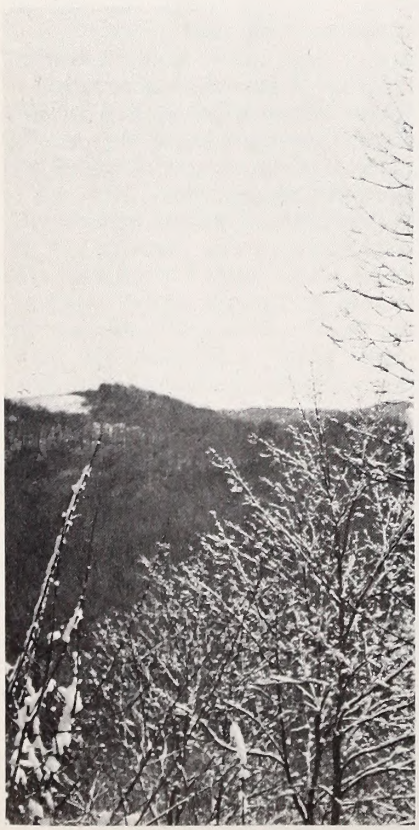
The key is to select and pack gear which a person can manage effectively. More than 35 pounds is difficult to handle and with the newer fabrics and designs a hiker should be able to get by with less weight and still be comfortable in the coldest, wettest weather.

Food is even more important in winter since the body burns more calories in the cold weather. More time and thought must be given to an adequate menu and the quantities necessary for hot, nourishing meals.

If a hiker who reads this article decides to shed the image of summertime camper, I have one request.

Please don't divulge the source of the idea. My friends and I still prefer the "off season" trails because they are uncluttered . . . remember? ⬍

Perhaps the main thing in any hiking experience is to have a good time. If the weather is uncooperative, make allowances for it. You may want to forego the modern camp stove and enjoy the warmth and smells of an open fire.



- Letters
- Comments
- This & That

BACK OF THE BOOK

Way of Life

On the snow-shaded peaks of the Smokies, the sound comes first as a wavering whine and seconds pass before the image of the intruder gains entry to my consciousness. I look down into the valley at the white tree tops, not wanting to see the contrails of the jet I know is above me now. Once before on this trail, I heard a buzzing, growing in strength as it approached me. The quietness of the mountain was impressed upon me when I realized the buzzing was that of a bumble bee, 20 feet away.

The drone of United flight 404 begs my attention. Charleston, West Virginia to Atlanta in 70 minutes; the stone mass of the mountain on which I am a dot is overflown in two seconds. Pity those above.

The stewardess moves her hair behind her ear and tugs on the steel drawer containing cold ham and cheese on Pittsburgh rye. Passengers, hungry from energy expended competing for first in the security-check line need refueling. The mountain is an unnoticed crinkle in the whiteness below them. Something to accept the whine of spinning steel engines. The captain announces the beginning of the descent into Atlanta. A brown-suited businessman with a paunch soothes his world-torn psyche by reciting the week's successes to a belted-in captive listener.

I turn to look up the line of the climb ahead. The quiet of Smoky returns. The beauty of snow on virgin hardwoods and the artistry of field mouse tracks across my path call my mind back to this billion year old rock-turned-soil that fills my imagination with reverence for life and time.

H. Edward Stone, Jr.

Whitefoot Mouse

This is the title of an intriguing little book by "Wildlife" contributor ("The Opossum is Here to Stay", January, 1972) James A. Sullivan. A fine photographer as well as convincing writer, Sullivan combines both skills in this book, and comes up with interesting, informative and pleasant reading. The book sells for $4.29, and is published by Coward, McCann & Geoghegan, Inc. 200 Madison Ave. New York, N.Y., 10016.

Woodcut Prints Available

From time to time, you will see woodland and marsh birds in the form of woodcut prints in odd corners of this magazine. The barrel owl is one of them, and the black neck stilt, avocet, and Wilsons phalarope will follow. These are 8½ by 11" woodcuts on special print paper and are available at $6.00 (matted) from B.C.P. Marsh, 1213 Duplin Road, Raleigh, N. C. 27607.

Big One Didn't Get Away

Yes, it's really that big. The eight-foot, 350 pound, long nose sturgeon was taken in the nets of Sam Cook, shown here with his prize. The sturgeon . . . just 30 pounds short of the North Carolina record . . . came from the Neuse River near New Bern last August. Sam had taken another one, a 100-pounder, from the Neuse earlier that month. The Russians probably hold the world record with a Volga River fish of some 3,250 pounds caught in 1827.

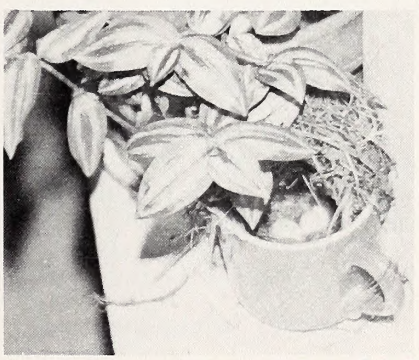
Siltation, chemical and other pollution likely have taken their toll of sturgeon in our coastal rivers and the current populations of these fish is probably quite low. But if your net, set in commercial waters, comes up with a piano-size hole, maybe you just lost a record sturgeon . . . and tubful of caviar.

Photo by Chuck Beckley
New Bern "Sun Journal"

Suits Bird to a Tea

Dear Sir:

As I like very much to read "Wildlife" and also love the pictures that you print, I thought you might like the pictures of the bird that built a nest in a tea cup on



my front porch last spring. I left a tea cup sitting on one of the columns on my front porch and when I went back to get it, there was a bird nest in it. I thought my son had put the nest there, and he thought that I had put it there!

I just didn't mention it to him but I left the cup sitting there and happened to look in the cup a couple days later and there were four eggs in the cup. I stayed away a few days and the mother bird was on the nest the next time I looked so we left her alone. She hatched three little birds and they were growing and doing fine until a cat or something killed the young. I was very sorry because I love birds.

Mrs. S. C. Williams
Union Grove

KNOW YOUR ENFORCEMENT OFFICER

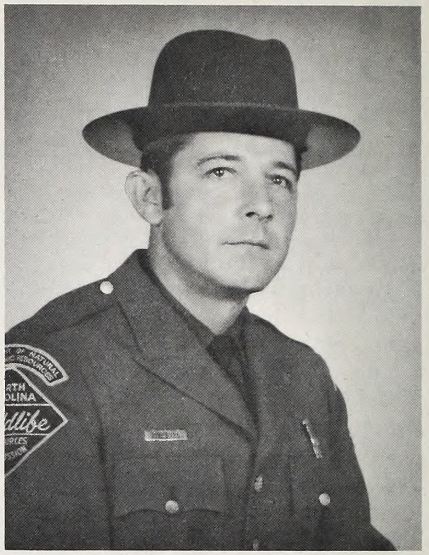
Wildlife Enforcement Officer Richard L. Byrd, stationed at Kinston, North Carolina, Lenoir County, was born November 30, 1940, in Chatham County. He is the son of Mr. John W. Byrd of Sanford, North Carolina, and the late Mrs. Thelma Thomas Byrd. Richard is a graduate of Sanford High School.

Prior to employment with the N. C. Wildlife Resources Commission he was employed by the Central Carolina Technical Institute as a Masonry Instructor.

Richard completed the pre-service school for wildlife protectors at the Institute of Government, Chapel Hill, North Carolina, in December of 1967. He was employed as a Wildlife Protector Trainee on July 1, 1968, and stationed in Henderson County. In November 1968 he was appointed Wildlife Protector and transferred to Kinston.

Protector Byrd is a member of the Southeastern Association of Game and Fish Commissioners, Law Enforcement Section: North Carolina Association of Wildlife Law Enforcement Officers; and the Lenoir County Wildlife Club. He has completed five in-service training schools and is a Hunter Safety Instructor.

Richard now makes his home at Route 7, Box 245 SI, Kinston, North Carolina. He has two daughters; Jan, age 12; and Susan, age 10.



Richard L. Byrd

Lost Dog

"Brittany", a 55 pound retriever, has been lost for several months in the Mt. Gilead, N. C. area. She stands about 20 inches high, has a thick reddish-brown coat, and walks with a slight limp. A $50 reward has been offered by owner Miss Linda L. DeLong, U-box 3826, Florida State University, Tallahassee, Fla., 32306.

Beach Buggy Association

If you're interested in beach buggies and their proper use on the beach areas of North Carolina, you may want to check into the N. C. Beach Buggy Association, through its Secretary-Treasurer, Robert W. Pinault, Point Harbor, N. C. 27964.

Needs Information

Dear Sir:

I have enjoyed Wildlife in North Carolina. It was sent to me as a gift from a Mr. Walton. I must have met the gentleman somewhere being a hunter. I have enjoyed the magazine so much so I am sending in my renewal.

Would like to hear from Mr. Walton. He must be a subscriber and live in North Carolina. Was wondering if you might print this letter; if so, Mr. Walton might get in touch with me.

Thank you,
George Kisling, RR Box 119,
Pleasanton, Neb. 68866

NASCAP . . . . Worth Checking?

"Wildlife" magazine generally goes slowly in recommending organizations to its readers, because we often have little opportunity to check them out, to see their structure, organization, aims, etc. One group that has come to our attention you may want to investigate: National Society for Conservation and Animal Protection. Its address is P.O. Box 3129, Bethlehem, Pa. 18017. Then you make up your own mind.

PHOTO BY BILL JANSEN

Greenville Access Area

The new Greenville Access Area on Hardee Creek in Pitt County has been completed and opened to the public. This site is approximately one mile east of the Greenville City Limits on SR 1533. The area is on the Hardee Creek Turning Basin on land provided by Pitt-Greenville Port Terminal Commission.

The access area has two concrete launching ramps, timber boarding docks and a gravel parking area. The construction was done by Hoke Construction Company of Conetoe, North Carolina. The project engineer was Rivers and Associates, Greenville, North Carolina.

With the completion of this area, the Wildlife Resources Commission now maintains 124 public boating access areas throughout the state.

Wrong Sinkbox

Before John McDaniel (author of "Ocracoke Options", December *Wildlife*) and other waterfowl hunters who may have misinterpreted the term "sinkbox" used in the article are unfairly indicted, let us hasten to clear up the matter of what he was hunting from. The box pictured in the article is permanently affixed to the ground (actually dug into the bottom) and is not floating. The floating type *is* illegal (Subpart C, (c), page 5, Federal Hunting Regulations, No. 96), but the type widely used on the Outer Banks is legal. Probably the generally used term "sinkbox" shouldn't have been used in the article; the "proper" term is "screen blind." Sorry to have alarmed anyone on this.

Although the deer seasons are the exception to this volume of detail, we felt it would be misleading to print just "outlines" of the regulations. So, for the time being, you will find only the barest of mention of opening dates, etc., in the magazine. This means that you will generally have to rely on the Regulations themselves, which we will be happy to send you.

Tribute

This is dedicated to the memory of Robert Ruark. I did not know this great writer personally but he brought to my reading wealth a treasured book. The title of the book is *"The Old Man and the Boy" and all parents should be required to read it and then re-read it to their children. One of my most poignant regrets is my failure to let this man know while he was alive the impact that this writing made not only to me but to others whose lives were touched by his pen.

*Holt-Rinehart and Winston Publishing Co. $5.95.

Robert Ruark was a noted newspaper correspondent and author of many novels including "Something of Value" that dealt with the Mau-Mau uprisings in Africa in the middle fifties. Many of his novels show coarseness, cruelty, and brutality but in the "Old Man and the Boy", he swings 180° around to present a story that is tender and witty, charming and wholesome. It is about his boyhood near Wilmington, North Carolina, where a great deal of his time was spent under the outdoor tutelage of his grandfather. It is a book of nature facts, hunting, fishing and the general outdoors.

He is a great admirer of the "Old Man" and he lets you know this in the first two lines of the book when he says, "The Old Man knows pretty close to everything. And mostly he ain't painful with it." The opening description of his grandfather is just as direct. "The Old Man ain't much to look at on the hoof. He's got big ears that flap out and a scrubby mustache with light yellow tobacco stains on it. He smokes a crook-stem pipe and he shoots an old pump gun that looks about as battered as he does. His pants wrinkle and he spits pretty straight in the way people use to spit when most grown men chewed Apple tobacco."

In the book, Ruark's grandfather teaches him about bobwhite quail and how a carefully controlled covey will live in the same area for many years. This is done by providing the little gentlemen and their ladies with food, cover and protection from predators. Also by controlled hunting of the covey to prevent inbreeding that would eventually wipe out a covey.

Relating to the squirrel family, the "Old Man" soliloquizes on why God made so many kinds of squirrels. He reckons it was because He made little people, and big people, white, black, red, yellow and brown people so He just sort of had to balance things out with squirrels, deer, rabbits, fish and all other kinds of wildlife.

The book is well worth the price just to read when the "Old Man" takes his grandson fishing at dusk and tells him to sit, be quiet and fish. He also instructs him that when the fish don't bite to think. "Think about heaven and hell and just how long is hereafter. Look around you and don't take nothing for granted. Look at everything you see and listen to everything you hear, just like you were brand new come from another world and think about all those things and how they got there." The boy does as he is told and his sensitive description of the twilight world tends to put a lump in the reader's throat.

The "Old Man" is a natural philosopher and his conversations make for delightful reading. He is cynical where women are concerned altho love for his wife is apparent. He is a con artist who is loved by everyone. He describes a lazy man as one who loafs and fools around on a job that he is supposed to be working at. An idler asleep on a bench or a river bank is recovering from the rigors of the past and storing up energy for work to be performed in the future.

Robert Ruark died at age 55. In writing "The Old Man and the Boy", he created a classic that will be enjoyed by old and young, hunters, fishermen, outdoorsmen, nature lovers and conservationists. He wrote in the language that everyone understands and it is readily apparent that he knew his subject matter by heart. The "Old Man" raised him right.

My book was given to me on Christmas in 1951 by my son-in-law. In it he wrote, "In hopes that you will enjoy the boyhood of Ruark as much as I have". Johnny Meadows.

I can only say, thanks again Johnny for introducing me to "The Old Man and the Boy".

Bill Snyder

ADDRESS CHANGE NOTIFICATION

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Winter Visitor

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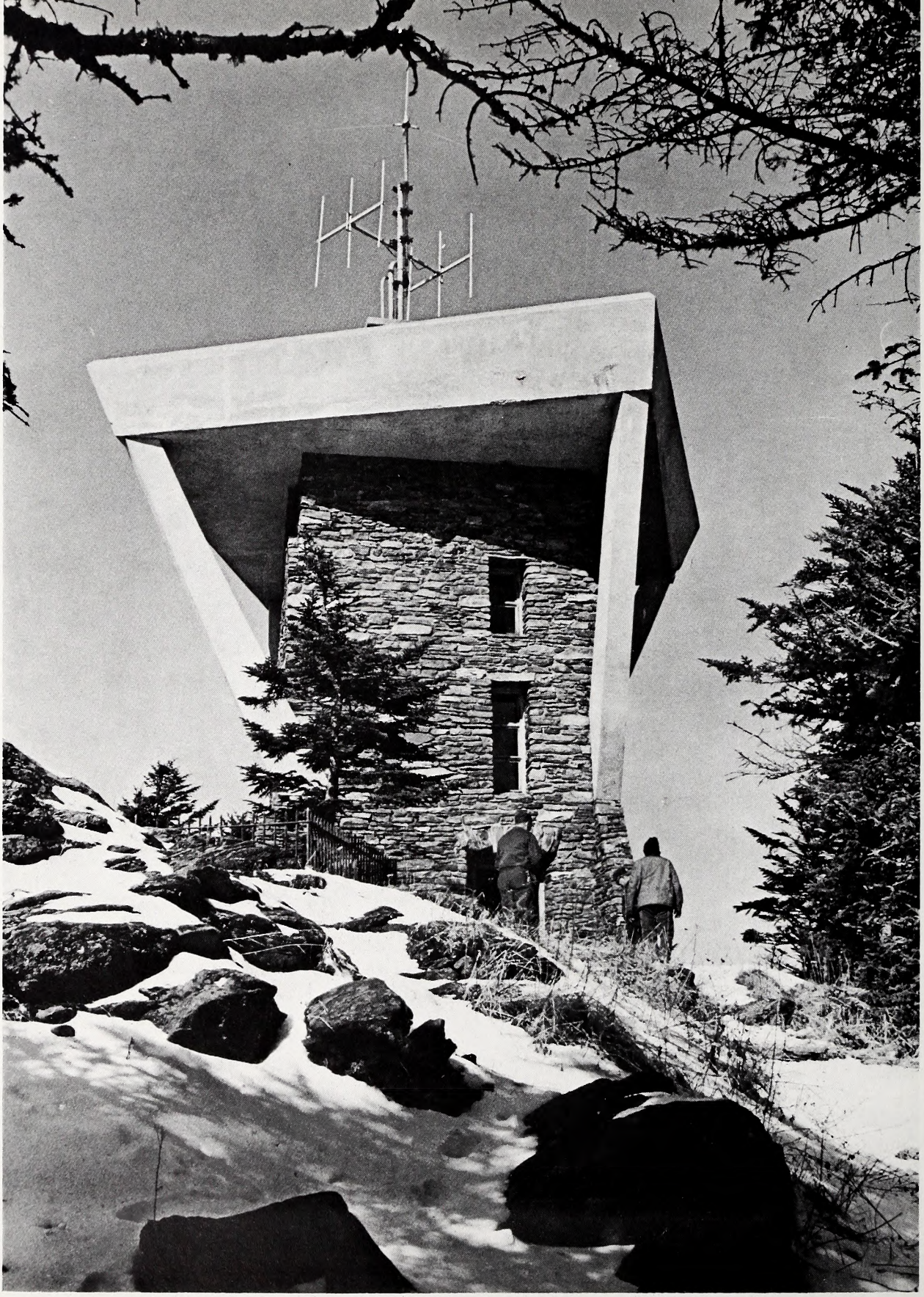

PHOTO BY HAROLD MOORE

THE SUMMIT

An observation tower stands on top of Mount Mitchell near the grave of Dr. Elisha Mitchell. He was a University of North Carolina professor who measured the height of the mountain and fell to his death in 1857, exploring the mountain. *See page 4 for related story.*

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Wildlife
IN NORTH CAROLINA ■

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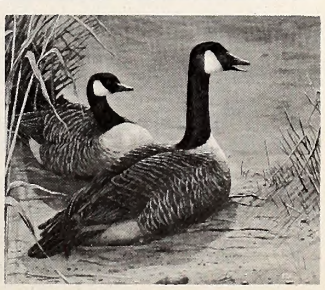
An objective of all levels of government should be to achieve and sustain a balance of the social, ecological, and economic benefits derived from natural resources. Without such balance none of the factors on the scale will be worth weighing.

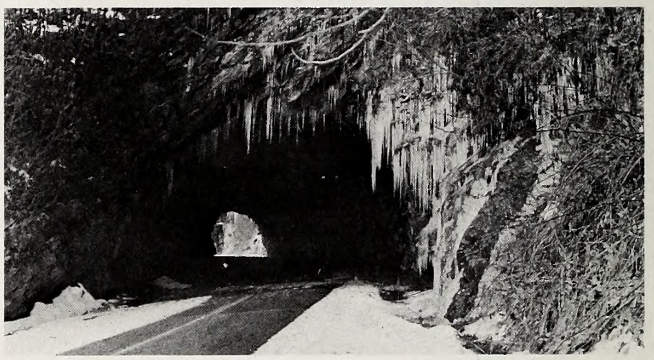


Resting a bit before considering the long flight to their far north nesting grounds, these Canada geese will be with us until perhaps the end of this month or early March.
Limited Edition prints, 19" by 24", over all, signed and numbered by the artist, are available from Jerry Ellis, 212 Pennsylvania Ave., Asheville, NC 28806.

Life on Top of Eastern America

Above, weather clouds roll across the "ranger's front yard" barely skimming Mount Mitchell, highest U. S. point east of the Mississippi River. Below, a light snow clings to the winding road that leads to the rangers' homes.

In some years, snowfall has been recorded for Mt. Mitchell every month of the year. Once in a while, ice must be chopped from the entrance of several tunnels so that rangers can get to their mailbox.



by Jim Lasley
Burlington
Photos by Harold Moore

WHEN a winter storm blows on Mount Mitchell it's like being engulfed in a white bed sheet. All you can see is a wall of snow. The wind howls in gusts of more than 100 miles an hour and the temperature hovers at 20 below.

If you venture outside you don't go alone. You hold onto your partner for fear of losing your way. If the wind is blowing hard enough you don't walk but crawl, and any sound you utter will be lost in the wind.

The state has provided you with arctic gear—$300 coats and $50 underwear, and the goosedown keeps you warm. There's enough food in the pantry to last the winter. The emergency generator will keep your cabin warm, while you wait with your wife and three-year-old son and three-week-old daughter.

When the wind subsides you start digging out. You're not snowed in as long as you can move, as long as the snowplow will run. Hoppy, the mountain-man, won't be worried if the machines are frozen up. He's not snowed in as long as he can walk out—16 miles on snowshoes.

This is Mount Mitchell, one of North Carolina's most remote points in the dead of winter. This mountain seems like it's on top of the world. You look up to nothing but the heavens.

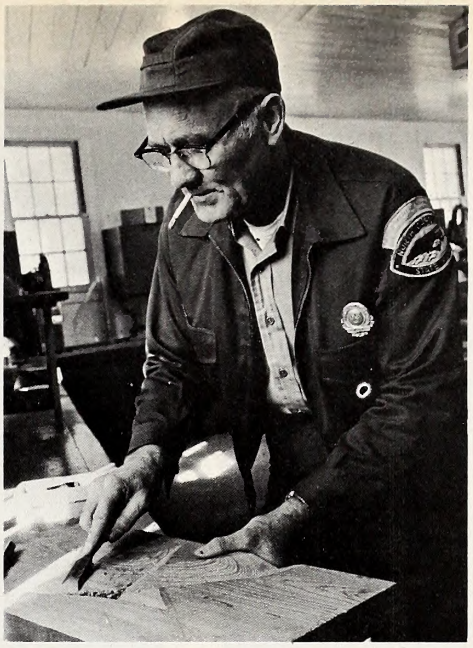
Mount Mitchell is the highest point east of the Mississippi River. It's 6,684 feet above sea level. About 300,000 folks visit this state park during the summer and fall. Nobody comes during the winter except occasional hikers. The roads are usually closed except to the rangers' snowplow and four-wheel-drive trucks.

Cliff Phillips and Clyde "Hoppy" Hopson live on top of the mountain year-round, Hopson in a cabin alone as he has for 20 years and Phillips with his young family. Both are rangers for the N. C. State Parks Division.

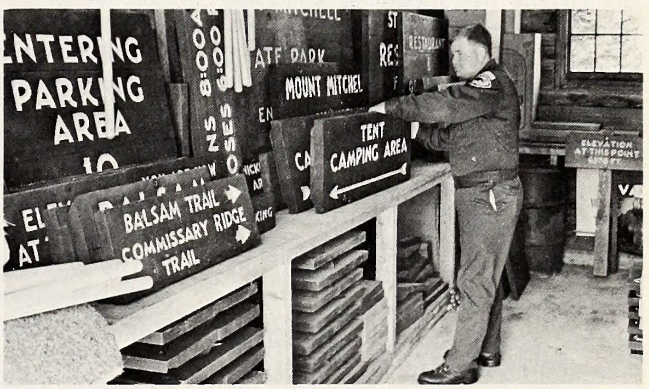
Mount Mitchell is in Yancey County, 34 miles northeast of Asheville and 32 miles from Marion and Burnsville. It's reached by a winding paved road leading up from the Blue Ridge Parkway.

Phillips, 28, is superintendent of the 1,049-acre state park which is Mount Mitchell. It's a job he says he wouldn't change for any in the world. He

Cliff Phillips, his wife and two children live in this cabin (above). Duties such as checking the weather station, keep Phillips busy and he says he never grows lonely, but his wife says that she does. It's a 40-minute ride each way just to the mail box!



Clyde Hopson, above, who calls himself a mountainman, spends many winter hours hand carving park signs and maintaining snow removal equipment. Signs are stored inside each winter. Supt. Phillips (below) says the cold would split them, otherwise.



and his wife are from Mount Olive in eastern North Carolina.

"Yep, this is home now as far as I'm concerned. You've got to love the outdoors to go into this. If you didn't you couldn't do the state a good job. It's different from other jobs; this is your life. You live with it 24 hours a day."

Phillips has been on the mountain since July of 1971. He's seen it minus 24 degrees with the wind gusting to 135 miles an hour.

"We were snowed in five days that first year. There were 30-foot drifts and the plow wouldn't go through. It took us a week to work our way to the mailbox but as long as we were moving we didn't consider we were snowed in."

Mount Mitchell's Alpine climate is much like central Canada. In the higher elevations the hardwoods are stunted, almost nonexistent, but there are forests of fraser fir, mountain ash and red spruce and the ground is hidden under a cover of shrubs and wildflowers.

Phillips tells of seeing an eagle summer before last, having a doe nibble from his palm, watching grouse from his car window, being chased by a 350-pound black bear and listening to the call of a raven.

On top of the mountain are the rangers' permanent camp of three cabins and a storage building. They keep enough supplies to last the winter. They call themselves self-sufficient.

Hoppy's been living alone on Mount Mitchell since July of 1955. His wife and daughter live 50 miles away in the village of Relief. He goes home about once a week.

"Nawww, I never get lonely," he said.

Why does he stay on year after year?

"I've been a mountain boy all my life, and living up here, this job, it keeps the wolf away from the door. I make enough for me and my family and I like being outside. And up here there's no stoplight when you cross the trail and you don't have to dodge people."

When the weather breaks in late May, Hoppy and Phillips will begin looking for their 12 summer helpers, college students. Soon they'll be opening the little restaurant and concession near the summit, and a steady stream of travelers will pour in until October.

But winter will come again and the first big snow, and that's when the rangers will stand atop Mount Mitchell in the silence of a howling wind. ▲▼

AERIAL ACROBAT

THE SPARROW HAWK

by Robert J. Warren
and James A. Wesson

AS it goes through its mid-air acrobatic act in its daily attempts to find food, the American kestrel has attracted the attention of more than one curious onlooker. Hovering effortlessly and almost motionlessly, it searches the ground below for delicate morsels. After spotting its potential victim, the kestrel plummets to the ground instantly and snatches its unsuspecting prey. This, the smallest of North Carolina's mighty birds of prey, is the only raptorial bird which hunts in such an unusual manner.

More commonly known as the sparrow hawk, the American kestrel (**Falco sparverius**) belongs to the order of Falconiformes and is related to all falcons, hawks, and vultures. Its other common names are windhover, because of its hovering ability, and killyhawk, because of its call, a sharp "killy killy killy." The kestrel, like other falcons, is streamlined, has long and pointed wings, and flies rapidly. About the size of a big robin, with a wingspan of about 21 inches and weight of about four ounces, it is the smallest falcon in North America. The female, like other birds of prey, is usually about one-third larger than the male.

The kestrel is a strikingly colorful bird with easily distinguishable plumage. The male is red and blue on his crown, slate-blue on his wings, and cinnamon on his back and tail; his light breast is spotted with black and his rusty tail marked with a black band at the base. The female's coloring is similar but not so brilliant. She lacks the bright red and blue and has multiple bars rather than a single one across her tail. On the backs of their heads, both males and females have large black spots with complementary light and dark markings which give the impression of eye spots. These spots, which appear to be a second set of eyes, seem to provide a form of protection for the blind side of the bird. Such patterns of facial mimicry are common in other animals.

The vision of birds of prey is probably the keenest of all living animals. While hovering at heights of 100 feet or more, the kestrel can easily spot the slightest movement of animals no larger than worms. With eight times the visual acuity of man, a kestrel atop the Empire State Building could easily spot a mouse on the street below. The kestrel's eyes are large and protruding and are situated in the head so as to allow binocular vision for better depth and motion perception. The eyes are so large that they can move very little in their sockets; the bird must, therefore, direct its vision by moving the entire head. Kestrels also have an excellent sense of hearing and will investigate any cry which is similar to that of injured prey. A sense of smell, however, as in most birds, is almost completely missing.

The American kestrel or sparrow hawk was once widely used in falconry. All hawks are totally protected by law in North Carolina and cannot be captured or possessed. The male kestrel has slate-blue wings, rusty back and tail. The curved beak is very sharp and used for tearing the hawk's prey.

PHOTOS BY THE AUTHORS

The kestrel has a remarkably extensive range. It occurs throughout most of South, Central, and North America at one time of the year

Kestrels are one of the few hole-nesting hawks (above) and seek out the abandoned nests of flickers and other large woodpeckers. The female at right, holds a recently captured white-footed mouse which will be its food for an entire day.

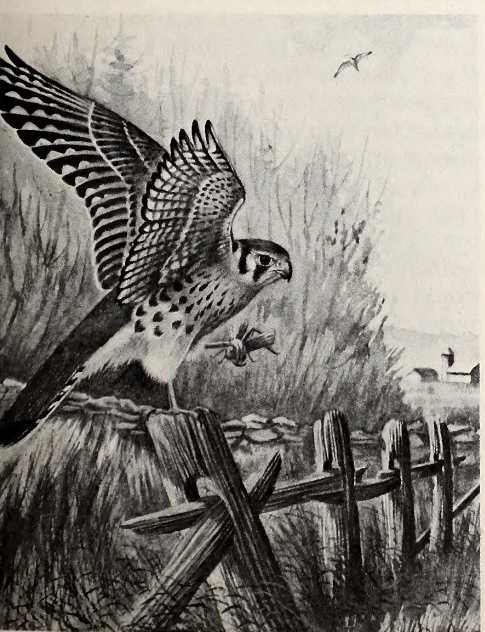
PHOTO BY RALPH E. MIRACHI

or another. In many parts of the United States it is present year round. The kestrel is a resident of North Carolina throughout the year although it is slightly more numerous during the winter.

The two most important reasons for the wide distribution of the kestrel are its adaptability to a broad variety of feeding and nesting habits. Kestrels are general feeders; although they feed primarily on insects, they will take a large variety of other prey. Since very little of the kestrel's diet consists of sparrows, sparrow hawk is a misnomer. In winter kestrels take mice and a few small birds; in summer they prefer small reptiles and a wide variety of insects. They normally eat about 25 percent of their body weight per day, the equivalent of one small mouse. Like other birds of prey, kestrels cease hunting once their daily food requirements are satisfied; they do not kill for amusement and normally consume a very small portion of the available prey within their territory.

Grasshoppers are high on the preferred diet of the sparrowhawk in the summer. They seldom tackle large prey although small birds are captured now and then.

ILLUSTRATION BY RON JENKINS



The kestrel does not take food in the air but usually captures its prey by diving quickly to the ground from a hovering station or perch. This "aerial acrobat" hovers by putting its head into the wind, bending its tail downward, and gently fanning its wings to maintain height. It may glide a short distance and take a new hovering station, or it can quickly drop to the ground for the capture. It is not unusual for a kestrel to spend more than an hour hovering, dropping to the ground occasionally to catch nothing more than a butterfly or a grasshopper.

Kestrels are becoming more numerous, in part because of their adaptability to different nesting sites. Originally using woodpecker holes, holes in stream banks, and old crow nests, with urbanization they have adapted to new nesting sites. Crevices in buildings, bird houses, nest boxes, and other nooks and crannies in buildings are good substitutes when the kestrel lives in or near urban environments.

Although small in size, the American kestrel is not small in numbers, and because of its adaptability has remained the most common hawk through much of the United States. Like most birds of prey, the kestrel is wholly beneficial or at least harmless to man's interests. Unfortunately, many people are hostile to this and other raptorial birds and some wantonly destroy them. The very small damage done by birds of prey has usually been greatly exaggerated, and, as a result, these birds have acquired an entirely undeserved and potentially dangerous reputation. They are valuable aesthetically and perform an important function in maintaining the balance of nature, while at the same time providing an extremely beneficial service to the farmer by controlling many insects and rodents. Additionally, kestrels are easily raised in captivity and are used by the United States Fish and Wildlife Service to study the effects of environmental pollutants. These hawks and other birds of prey deserve protection and as are all hawks and owls in North Carolina, are protected by law. ⬍⬍

TEN to ONE

by Rod Amundson

IT was after five-thirty, and some of the boys were beginning to gather around the pot-bellied stove in Guppy's General Merchandise Emporium, Guppy's Crossroads.

Luke Guppy, owner of the store, is not especially old-fashioned; he believes in supplying his customers with everyday needs. The needs range from mule collars to ladies' undies, and are often displayed in close proximity.

I came in to get a cup of Luke's potent coffee and a barbecue sandwich with chopped onions and a bowl of Mrs. Guppy's delicious homemade chili, which she confided one time is seasoned with wild onions.

As usual there was an argument going on, and as usual it had to do with who had the best bird dog—Luke's old buddy and neighbor, Elmo Cooter, or Clete Elmore.

"Elmo," said Clete, "I know why you named that dangfool mutt of yours 'Ram.' He'll ram into a covey of birds half a mile ahead of you. I seen him point a rabbit one time!"

Elmo squirted a stream of tobacco juice that sizzled on the stove, shifted the cud to the other side of his mouth, and said, "Clete, ol' Ram has forgotten more about bird hunting than that mangy mongrel of your'n will ever learn. You oughta seen him last Saturday. It was gittin' on toward sundown, and I knowed he was on point. But the brush was so thick I couldn't see him and he didn't come when I called. I went home, ate supper and come back out with a flashlight to look for him. It was pitch dark, and when I found him he was still on point and that covey of birds was sittin' in a circle, sound asleep."

"That aint nothing," said Clete. "My little ol' Bitsey has got the best pedigree of any setter in this part of the country. Let me tell you 'bout her grandaddy, Pokey. We called him Pokey because he was a slow poke, but he was steady and wouldn't never break a point.

"'bout five years ago me and cousin Goatsford hunted him last day of the bird season. It was gittin' dark, like you said, and we couldn't locate him. Went back the next mornin', and the next, and the next and finally give up. Next summer we was cleanin' brush along the trail to the soybean field and we found him. Nothin' but his bones and his collar hangin' 'round his neck. The birds was gone, but ol' Pokey was still on point!"

There were a few guffaws and some shuffling of feet among the hangers-on, and no one said anything for a while. Luke's shoulders were quivering like he was laughing inside. Finally Elmo spoke up again.

"Clete," he said, "If you think that dang mongrel of your'n is so cotton pickin' good, why don't we jus' go out an' see who has got the best dog?"

"Shucks, Elmo," Clete responded, "Ol' Bitsey wouldn't be seen in the same field with ol' Ram. She's ten to one better than he ever will be!"

"Ten to one. Ten to ONE? Man, put your money where your mouth is," said Elmo. He laid a five dollar bill on the counter.

Clete looked at the five, looked around at the now silent group, and pulled out his billfold. "I aint got fifty on me, but I'll write you a check."

"That's good enough for me," Elmo said, and the deal was closed. Luke picked up the check and the bill, placed both in a wrinkled envelope and put them in the cash register.

"A bet is a bet," Luke said, but when we goin' to see who wins?"

Clete and Elmo looked at each other and agreed that since the next day was Saturday, nine in the morning would be fine. There was considerable argument as to who would be the judge, and it was finally agreed that since I was from another county I would be the referee. When Luke told me a night's lodging, supper, and breakfast would be on the house, I agreed.

I slept late, ate a leisurely breakfast of country ham and scrambled eggs, and it was still foggy and misting a little at eight-thirty. A perfect day for quail hunting and good bird dogs.

There was a long argument as to where this mini-field trial should be held. Luke contended that the contest would be more even if the dogs were turned loose on land they had never hunted on before. After all, both probably knew where all the coveys were on their home grounds. So it was finally decided the hunt would be held on Uncle Lem Crowder's place several miles down the road. There was a general exodus in that direction.

By the time we reached the first field the sun came out. Bitsey and Ram were released, and both dogs began quartering beautifully. Ram made the first point, which Bitsey honored. Then Bitsey pointed and Ram honored. This went on for over an hour. Both retrieved beautifully, and I realized I had a tough contest on my hands.

In the next field, a covey got up after both dogs came to a simultaneous point. Elmo dropped a bird cleanly, but Clete's bird angled off and fell into a farm pond. Ram retrieved Elmo's bird, then headed for the pond. When we reached the pond old Ram was standing on a ramrod point—at the water near the dam; but there was no sign of the bird. Quail can swim, and dead ones float.

Despite the blue streak of curses Elmo directed at Ram the dog held his point. Elmo Cooter is well known for his temper and I'm sure he figured his five dollar bill was a goner, not to mention the ridicule his erring pointer would bring down on him. Clete was lying on the ground, laughing.

He pulled up his gun and shot at Ram's head. Fortunately he missed. There was a shocked silence among the spectators and Ram stayed on point. Then there was a slight swirl in the water at which Ram was pointing, and up came about a 12-pound large-mouth bass. In his mouth was a still-warm bobwhite quail.

Elmo laid his gun down and knelt down beside Ram. He didn't say anything, just patted his head and scratched behind his ears. Clete Elmore stopped laughing. ◆

Jay Waggoner

IN MEMORIAM

When Jay Waggoner of Graham died on December 5, 1975, the sportsmen of North Carolina lost a good friend. Jay was Commissioner of the N. C. Wildlife Resources Commission's District Five, a post he had held for more than 12 years. At the time of his death, he was vice chairman of the Commission, and had been chairman in 1970.

Friends will remember Jay as an avid hunter with a keen fondness for well-bred setters that fulfilled their promise in the field. While he had a special affection for the wild turkey, he also hunted bobwhites and other species and occasionally wet a line seeking shellcrackers and bluegills. His knowledge of the outdoors was an asset to the Wildlife Commission, and helped him make sound decisions which were in the best interests of the rich resources of wildlife in this state.

Jay was a strong believer in the value of research, management and protection for fish and game, and biologists who worked with him over the years recall that he was inquisitive about the natural laws that govern wildlife populations. It was also his belief that education was a matter of great importance and that the future of wildlife populations lay in the support from an informed public.

Jay was proud of having played an important role in the expansion of the Wildlife Commission's public hunting and fishing lands. During his tenure as a Commissioner, the Game Lands were expanded from a few hundred thousand acres to nearly two million acres. He felt that the need for such public areas would become increasingly critical in the years to come, not only for sportsmen, but also to provide quality habitat for fish and wildlife.

Jay Waggoner will be missed, but his good works will stand to guide us all. ◆

Jay was an avid turkey hunter and proudly displays a fine gobbler taken several years ago (above). Perhaps his greatest pleasure came from the dogs he kept, trained and hunted with. Jay Waggoner was an active outdoorsman, and knew the needs of wildlife and the sportsman.

THE AMERICAN WOODCOCK
A Mysterious Visitor

by Charles M. Rucker
Photos by the Author

● I was only 12 when it happened the first time. A fall day was quickly expiring. The sun was setting bloody and tired as I stood on the dam of Hubbard's Pond, hoping for one last shot at a passing dove.

The lone figure of a distant bird danced in the air—and it was coming toward me. But it didn't show the smooth, rhythmic wingbeats of a dove. This bird flew in an uncertain manner; almost like a bat or some other creature of the twilight. Silhouetted against sky and water, this strange form passed quite near. I could see no colors, but noticed a bill of insane length—which in extent came to remind me of a huge mosquito. Finally, it cleared the dark pines and settled somewhere in the swamp below the dam.

The pleasant late-afternoon coolness was now chill. As the gun relinquished three bright red shells, I tried to reflect upon the meaning of this experience. But the matter was soon dismissed; destined to join all the other unanswered questions of that age.

On two occasions since then, while walking through a damp "bottom," I flushed birds with long bills that twittered in their speedy escape.

It was four years later that I became quick enough with my father's heavy double-gun to shoot my first woodcock in its explosive and erratic retreat. Anxiously, I retrieved the bird to see if it would live up to my bizarre expectations. I was not disappointed. Nature had done an exceptional job of camouflage on this bird, as She does with all creatures which depend upon surprise and accelerated retreat for survival. In fact, it blended in so well with the dead fall leaves that I would have lost it altogether if I had not "marked" it from where I had shot.

Its coloration was a basic grey and brown with black spots and bands pronounced mostly on the wings and back. The belly was just clean chestnut from throat to rump. The tail was simply a tuft of light and dark brown feathers with a white band across the end. Regardless of season, this was as finished a camouflage job as could be desired. The blacks, browns, and greys of its back and the top of its head blended so completely with the dappled habitat that it was apt to remain almost invisible—even after I knew its exact location.

Almost all living things which hide for survival are colored darker on the back and lighter underneath. It is because when the sun shines on an object it tends to lighten the dorsal side of it, and since shadow is produced, the ventral side is darkened. This is nature's attempt to neutralize this effect. The third dimension—depth, is inhibited thus giving in this case, the woodcock, a better chance to be overlooked by predators. Countershading is the technical term for this condition.

Odd Shape

The woodcock has a general dumpiness about it. Most of its bulk is expressed in the breast and abdomen, thus giving the bird a prevailing pear-shaped symmetry.

The male tends to be a shade darker than the female and weighs five or six ounces. The female averages about one ounce heavier.

Its head is the main reason why most people refer to this bird as an avicular oddity. The bill can measure better than three inches—or comprise about half the total body height. Its structure is in a curious tweezer arrangement. The upper mandible is slightly longer, and the lower fits neatly into it with a slight overlap on the tip. Nature again has ingeniously met a situation with adaptation. This bill is probed into creek mud to grasp earthworms, which are the mainstay of the woodcock's diet. The bird is capable of opening only the last inch or so of its bill to minimize resistance from the mud — which takes less strength. And if that's not enough, the fleshy tip of its bill is sensitive to the extent that the woodcock can discriminate between edible and nonedible material without pulling it up to find out!

The eyes are another mystery. They are strategically located high and slightly to the rear in its head. This phenomenon provides the bird with an exceptional range of vision while feeding or flying. Being nocturnal in its habits, they are designed to provide the maximum benefit from even the dimmest light.

A woodcock's legs are fleshy and weak. This partly explains why they almost never run before flushing, like quail frequently do, and why they usually "sit tight" for a dog.

Its extended wing shows that they are built along gamebird lines, providing it with a quick take-off and fast getaway. But the weight-to-wing-area ratio is considerably lighter than those of such birds as the grouse or pheasant, and it is capable of long sustained flights. A close look at a woodcock wing will reveal three rather long and slender primary feathers. These are found on the wing tip and are slightly

curved to the contour of the pinion.

There is speculation that these primaries produce the noted "twittering" sound that is characteristic of a flushed woodcock. In an attempt to isolate the source of this sound, one scientist confined a bird in a rather large pen, of ample size to permit flight. This bird invariably twittered when flushed. He then captured it and clipped all primary feathers off each wing. After that, the bird made no noise whatsoever. And yet, another expert wrote:

"In the fall of 1940, my hunting partner and I were hunting in an old apple orchard where a rank growth and Canada bluegrass covered the ground. The dog came down on point and I walked in to flush the bird while my companion stood to one side, gun ready. As I walked by the dog, there was a disturbance in the grass, almost directly under the dog's nose, and I looked down to see a woodcock struggling to free itself from the tangled mat of grass. While there was no appreciable wing movement, the grass being too thick for that, the characteristic twittering sound of a flushed woodcock was being made as the bird struggled to free itself. The noise continued, unabated and unchanged, while the bird tunneled through the grass, wings folded, and then took off on its typical woodcock flight. Neither to my own ears nor to those of my companion was there any variation in the sound the bird made while it was trapped or after it had freed itself."

The topic of whether the "twittering" is mechanically or vocally produced is still open for debate.

Natural Enemies

The natural enemies of the woodcock seem to be relatively few. To be sure, there are cases of birds being taken by foxes, weasels, goshawks, marsh hawks, duck hawks, sharp-shinned hawks, great horned owls, and even little screech owls. These cases are rather isolated instances, and not the general rule. It is quite probable that these predators feed upon woodcock as a last resort when they are very hungry. There seems to be an odor about the woodcock which some animals find offensive. My bird dog, who will retrieve the same quail until he gets bored by repetition, will retrieve the same woodcock only once. My only clue to this obvious distaste is the fact that the meat is dark and rather oily. While cleaning dead birds, the odor becomes detectable even to humans, and I would assume it is externally present in sufficient amounts to repel dogs. No doubt the creatures of the wild feel the same way about it—with one exception. Woodcock studies conducted in Maine revealed the fact that the house cat, either domestic or feral, is the principal predator with which the woodcock must contend.

As Mark Twain once commented, "that while everybody kicks about the weather, nobody ever seems to do anything about it." The woodcock is one exception. Let the ground become too dry to supply its fancied earthworms, or freeze solidly so its tweezer-bill is rendered useless, and this bird will have left before the sun rises on the succeeding day. In no other situation is the term, "fly by night" more apt or suiting than for a dissatisfied woodcock. And it is for this reason why many a woodcock hunter has been baffled by encountering birds in profusion one day, and return the next to find the same thickets barren.

The manner in which the woodcock migrates is also subject to debate. Their flights, being made almost entirely at night, make observation difficult at best. It is unlikely that they travel in flocks, as in the manner of ducks or blackbirds, but there does seem to be a certain coherence to their movements. Audubon wrote in 1835 that woodcock, "follow each other with such rapidity that they might be said to arrive in flocks, one coming directly in the wake of the other."

Perhaps the most fascinating of all woodcock aspects is their courtship dance. This curiosity is to be observed principally in northern states and of course, in springtime.

The male seems to be the one who chooses the singing ground, from which he woos the hen-bird. The singing ground itself is apt to be most any type of ground that is free from trees or brush. Plowed fields, orchards, lawns, fernbeds, meadows, pastures, will do nicely.

The male is a true respecter of territorial rights. He not only refuses to trespass on the claims of others, but only very seldom does he establish his activities within 150 yards of another party.

The climax of the dance always occurs in the last available light of the days in April and May. It is then that the male will demonstrate a truly spectacular example of aerial exhibitionism. His take-off is always accentuated by the twittering of the flushed woodcock. Only this time, his flight is spiralling—and straight up, as high as 300 feet. He ascends until he is barely a dot in the twilight sky, hangs there a moment, then commences a twisting dive which seemingly, will have to end up in an inevitable crash landing. About 20 feet above the ground, however, he pulls out of the dive, drops wing flaps, circles, and touches down gently. Immediately he regains his composure and struts pompously; quite pleased with himself and his performance. How could a female woodcock fail to be impressed? ▲▼

This is excellent woodcock habitat: the taller brush provides cover for feeding or resting birds, while the damp grassy ground contains a good supply of the bird's favorite delicacy, the earthworm. The Brittany Spaniel (at left) is well equipped to locate the woodcock. A fine sense of smell and its low stature help the dog find birds in heavy cover. The bell helps the hunter find the dog!

GETTING STUCK ON BLADES

Knife collecting is a fast-growing mania with strong ties to our heritage.

by Jim Dean

I'VE never met a truly happy person who didn't collect something. Most of us start very young with such things as bubblegum cards, bottle caps, pennies, stamps, marbles, butterflies, matchbook covers, arrowheads, rocks and heaven knows what else. Sometimes, these same hobbies carry over into adulthood, especially when such items as stamps, coins, guns or things similar are concerned.

But collecting is hardly confined to such ordinary items. I know some people who collect beer cans from all over the world. Old bottles are big now. There is a national organization which collects Edsels. Believe it or not, I once knew one guy who collected navel lint (he had a cigar box full, but don't ask why).

In recent years, I've become interested in collecting knives, especially old pocket knives. It probably stems from my interest in hunting and fishing, but actually it's more than that. I've always carried a pocket knife, and I'd rather forget my socks than forget my blade. I'm not alone. Knife collectors are among the most gloriously obsessed of all collectors.

My interest snowballed recently when I attended the National Knife Collectors and Dealers' Association "Knife Show" this past September at Greensboro. It was the first time the national association has ever held a big show in North Carolina, and knife collectors poured out of the woodwork like termites at a plywood convention.

Knife collecting, like all other forms of collecting, is somewhat contrived. That is, the items which are most desired may in fact be the most useless. Values are usually assigned on age, historical significance or scarcity. It's almost as bad as stamp collecting where a tiny scrap of paper with foul tasting glue on the back is worth thousands, maybe millions, of bucks because it happens to be one of the few left in the world. Nevermind that a million dollar stamp might not be adequate to mail a post card; that's not what counts. I think you see what I mean.

Of course, the knives you collect are at least potentially useful. Or at least that's what I thought until I learned that it is almost a crime to sharpen one.

Set a whetstone against the edge of a knife and you run the risk of destroying some of its value to a collector. In the middle of perhaps half a million dollars worth of knives at Greensboro, I couldn't get a pencil sharpened to make notes for this article.

Of course, that didn't bother me because, as I said, I'm hooked on knife collecting and if dull blades are beautiful, so be it. I may not have 600 clams to lay out for one of those early Remington Bullet pig stickers in mint condition, but I can appreciate the craftsmanship and history evident in the horn or bone grips and cold steel.

My own collection consists of a dozen knives of dubious value—for one thing, they're all sharp—but someday I may find an unsold card of early Case classics and I'll be ready to move into the big time.

Serious knife collecting can be both a source of continuing pleasure as well as a solid investment. Like fancy old double shotguns, old knives are worth money.

One collection—the largest on display at Greensboro — consisted of some 1,200 knives worth an estimated quarter of a million dollars. Their value rises each year, a good hedge against inflation. This particular collector (whose name I'd prefer not to mention) has knives from all over the world, but his finest displays are of early American knives.

Most collectors, I learned, specialize in some way. I talked to one man who collects only early Sheffield pocket knives. Others concentrate on early Indian trade knives, like the Green River blades. Sev-

Collectors browse at the National Knife Collectors' Show in Greensboro (above).

This quarter million dollar collection was one of the most popular displays (left); Ben Kelley, Case Cutlery repair agent, polishes a blade (right).

eral collected early Barlow pocket knives by such famous manufacturers as Russell and Remington. Some collect only sheath knives, while others seek only folding knives. One collector had an interesting display of Civil War relics captured from prisoners of war at Andersonville. Many collectors stick with one brand name, trying ultimately to own at least one perfect specimen of every type of knife ever made by that company. For example, a considerable romance has built up around the famous Case brand (still made today, by the way), and many of the collections on display at Greensboro consisted entirely of Case blades in every imaginable shape and size.

W. R. Case & Sons Cutlery Company is hardly unaware of this tradition, and it is no accident that small variations are made in knife models regularly. Often, the change is nothing more than altering the number of dots found at the base of the main blade. This instantly creates a new collector's item. Of course, most of the Case knives are bought by people who plan to use them and buy them because they are good, dependable knives.

In one corner of the huge room at Greensboro, Ben W. Kelley, Jr., of Tucker, Georgia, an authorized repair agent for Case, had set up a booth to repair knives. Ben is a skilled craftsman, and I watched him with fascination as he polished blades, tightened fastenings and turned virtually worn-out Case knives into like-new pieces. Ben's artistry is also apparent in the beautiful custom handles which he fits to knives on special order. He works in pearl imitation tortoise, white micarta and other exotic materials, even engraving them in handsome scrolls.

One of the problems involving the collecting of knives is knowing what's worth collecting—and more to the point—how much? There are a number of reference books available, one being the "Knife Album" by Col. Robert Mayes, PO Box 186, Middleboro, Kentucky 40965. Those seriously interested in collecting, may want to join the National Knife Collectors and Dealers Association, and avail themselves of any literature or other sources which list collectible knives and their values. The address of this organization is 1620 Mary Dupre Dr., Chattanooga, Tenn. 37421.

Of course, even the experts get stumped occasionally. Witness the following incident which shows not only the value of knowing your knives, but also the extent to which knife collecting can become an almost uncontrollable mania.

One of the collectors had a very strange and very old knife believed to be French in origin. The blade on this folding knife was eight inches long when he first opened it, but it was hinged so that when the point was folded out, you had a wicked looking weapon some 16 inches long. No doubt, in a knife fight 100 years or more ago, this feature provided a keen bit of one-upsmanship.

The knife attracted a good deal of attention, but not even the many experts could precisely identify it. For most of the day, no one offered to buy it, but in mid-afternoon, word got around that one of the more prominent collectors had offered several hundred dollars more than its listed price.

Word traveled rapidly and collectors huddled here and there wondering in whispers what the potential purchaser might know that they didn't know. Would it be worthwhile, they wondered, to make even higher offers despite their ignorance of the strange

• **continued on page 27**

CONTEST FOR CARVERS

by John Crew
Photos by the Author

DURING the middle of October each year hundreds of ducks, geese and other waterfowl converge on the City of Salisbury in southern Maryland. This is a rather unusual migration, and none of the fowl raft on the nearby Chesapeake Bay duck hunting grounds. To glimpse these fowl one must visit the city civic center which is the site of the annual Ward Foundation World Championship Waterfowl Carving competition.

This prestigous event honors two native sons from Chrisfield, Maryland, Lem and Steve Ward. In the 1920's, 30's and 40's these men developed a style of decoy that became the standard by which others are judged, and made the Ward Bros., Wildlife Counterfeiters, internationally known. Although no longer actively producing hunting blocks, the brothers continue to carve decorative models and are present at the event that bears their name. Contestants are drawn from throughout the United States and Canada and in 1974 a record number of over 1,500 entries were made.

Decoys are entered according to the carver's experience. Novice, amateur and professional classes are open to all who qualify. There are also three divisions of decoys; gunning or working blocks, made to be part of a hunters flock; decorative decoys, designed as works of art never to be used to lure their wild counterparts; and novelty decoys which can include species other than waterfowl. The novelty division frequently includes game birds and birds of prey in positions ranging from flying to feeding their young. Miniatures and a special inexpensive hunting class were also judged in 1974. Each division is further divided into sub-classes by individual species to facilitate a more equitable judging and ribbons are awarded to the top three entries in each class, division and species category.

All decoys are judged according to overall realistic appearance, life-like poses, symmetrical design, quality of painting and floatability. The deciding factor in the judges' mind must be how wildlife would respond to the imitation. In many instances the judges, all experienced decoy critics, had the difficult task of determining which decoy was the "better of the best."

During this two-day event decoy collectors, hunters, art fanciers, tourists, carvers, waterfowl admirers, and the curious added to the festivities and displays by sharing a common bond; seeing, buying, trading, talking about and photographing some of the best examples of modern waterfowl sculpture in the world.

For entry forms and other pertinent facts concerning the competition potential contestants should write the Ward Foundation, Salisbury, Maryland and request their information brochure. ◆

An adult peregrine falcon appears ready to fly from its perch (above left). It was carved with jesses and bells on, characteristic of a hunting falcon. A falcon (above) in the "novelty division" surveys his kill, an equally detailed carving of an old squaw drake. At left, judges test mallard decoys floating qualities. The way they ride may determine their award.

Even the best of carvers often come away from the exhibit and contest with a far more humble attitude about their own abilities! This drake widgeon even has a precisely carved tongue with which to scold an intruder.

Open That Barrel for More Birds

by Gerald Almy

● The young gunner holds the ancient firearm, bequeathed to him by his father, from his father before him, clenched tightly in his hands. His knuckles, tensed and white, stand out like pale lumps of sugar. Sweat bathes his nervous palms. The dog is on point.

"Quail are quick. You have to be fast with your gun. They're not like a rabbit," he recalled his grandfather's words. "Shoot quick or they'll be gone."

The sudden buzzing flush sets his heart pounding frantically like a racing engine. Dozens of quail scatter in every direction. "Don't shoot at the covey" flashes across his brain as he points at a crossing bird, blasts away both barrels before the quail has flown five yards, and curses himself for his ineptness as he shakily reloads the old, full-choked double.

* * * * *

The grouse hunter pauses to remove a grapevine tangled around his ankle. Cover is thick. As he straightens a fat, regal cock explodes violently from the vine-shrouded blowdown on his left. Instinctively he swings, knocking the 30-inch barrel into a sapling halfway through as he squeezes off the trigger. His follow-through is rudely retarded, sending the Number 8 shot charge hopelessly behind the departing grouse.

* * * * *

Woodcock are the game. The gunner treads his way haltingly through the overgrown, marshy creek bottom. The ground soil is moist and soft. Timberdoodles can easily harvest their sustenance here: earthworms are abundant. Chalk white slashings betray the presence of birds.

The hunter pauses in an inviting conglomeration of birch saplings. He knows the wily ways of woodcock. He knows their incorrigible urge to sit tight and let gunners walk past them while they lie hidden in the broken bed of leaves, camouflaged with their mottled plumage.

The pause whittles away at the courage of a cowering woodcock until he can stand it no longer. The exotic, twittering flush quickens the hunter's adrenalin. He is ready. His feet are firmly planted, evenly spread. He has room to swing his barrel freely. The timberdoodle levels off 20 feet in front of him and weaves its way through the dense stand of saplings. The hunter holds his shot momentarily, to allow the bird to get far enough for his modified choke to throw an effective pattern—wide enough to hit the bird without tearing him to shreds.

The strategy backfires! At ten yards the bird is invisible, totally enveloped in the jungle-like foliage.

* * * * *

These three scenes typify the misadventures suffered by novice shotgunners who handicap themselves by blind loyalty to heavily choked shotguns passed down to them from ancestors or picked up at the local pawnshop. Needlessly, young and not-so-young gunners have their hunting interests nipped in the bud by sentimental fidelity to a gun handed down to them from well-meaning relatives that is inappropriate for their hunting needs.

I am speaking of course, of those tight-choked, long barreled guns

passed down from generation to generation like some hereditary disease. Misplaced loyalty to such firearms as practical bird hunting tools causes scenes such as those above to be enacted hundreds of times daily throughout the hunting season. They happened to me, and they happen to far too many others in the formative years of their hunting development.

No one is suggesting that these ancient firearms be hung on the wall as useless display pieces, or that you dispose of them at the local government bun-buying fiasco. On the contrary, many of these shotguns can be converted into potent bird hunting weapons with a mere half-hour's labor. The process will save many beginners from needless frustration at a critical stage of their hunting interest.

For a lot of people, a dozen fruitless hunting trips could spell disaster and lead to a permanent rejection of the sport. Their confidence destroyed, many will give up hunting, completely unaware that the problem lay not with them, but with the inappropriateness of their weapon for the modern plastic shotgun shell they were using and the type of hunting they were doing.

Before describing the relatively simple procedure for opening up and shortening your shotgun barrel, let's briefly take a look at the way the gunners in the first three incidents described were handicapped by their shotguns, if it isn't obvious already.

The gunner in the first scene had a tight choked double barrel. It was an old gun, and he was proud of it. His grandfather had killed many rabbits and squirrels with it. He didn't see why he shouldn't be able to kill quail with it too.

Ah, if quail were only as easy to hit as squirrels! Impressed with the speed and noisy explosion of the quail, the impetuous youngster unleashed his charge far too soon, before the pattern of the choked gun was spread wide enough to cover an effective area. (He was shooting too quickly to have aimed properly also, and these are faults he'll have to learn to overcome.) But undeniably, a wide open gun is the appropriate weapon for such a youngster blessed with a quick instinctive swing, on quail that hold well and depart at close ranges. Indeed, with an open barrel and a little practice, the young gunner may be taking doubles regularly.

The second gunner suffers from a cumbersome 30-inch barrel. There is no place for this gun in thick, jungle-like grouse cover. Not only is such a long barrel prone to knock into trees and bushes that are bound to be surrounding the grouse shooter, but it is probably choked too tightly for the short shooting distances common in most heavily overgrown grouse coverts. Ducks and squirrels yes, but certainly not grouse with a long barreled, full-choked gun.

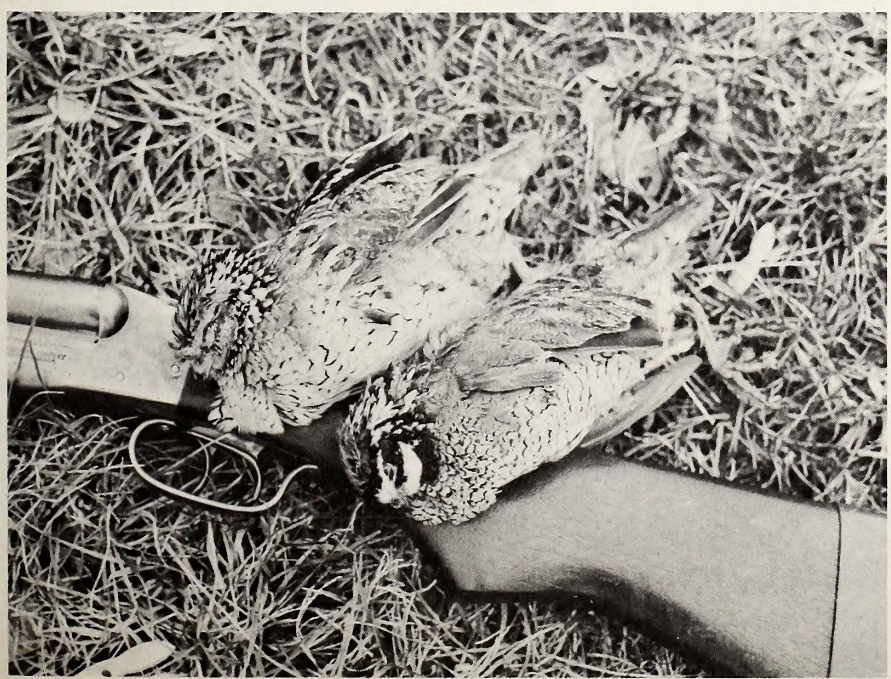
The third hunter is after woodcock, which are usually found in even more dense brush than grouse. Occasionally these birds will tower at a range where an improved cylinder or modified barrel would be appropriate. Normally, however, timberdoodles are out of shooting range, vanished into the impenetrable thickets, by the time they are 12 or 14 yards off.

This is extremely short-range shooting, but it's the only shooting possible under normal circumstances. So you take what you get. And if you are going to kill any birds under these conditions and still have something left to eat, fine shot, low brass loads, and a cylinder bored barrel are a must.

But just why have tight choked guns been so popular in the past? Several reasons. For one, long shots were more frequent then. Pheasants used to be a bird of the cornfields. Now they are rapidly becoming birds of the brushy thickets, where cover is heavy, shots short. To meet this altered situation, barrels must be brief and maneuverable, chokes open.

Quail, too, are turning to second growth forests and overgrown, tangled patches of shrubbery as gunning pressure increases in the open fields and meadow farmlands. Grouse, under mounting hunting pressure have fled to even more dense cover than they formerly inhabited.

Enough for upland birds. Often as not, grandpa may have used that trusty double or hammer-action single shot to hunt ducks, squirrels, and rabbits. If you hunt these game species, the tight pattern may still be your best choice.



One answer to clean kills may be an open barrel when it comes to hunting "woods birds" or those in heavy thickets. Generally, a "long" barrel is simply a handicap to the gunner and serves no useful purpose.

PHOTOS BY THE AUTHOR

But there were also sound ballistic reasons for the preference in the past for full-choked barrels. Until modern plastic sleeved shot shells came into use, many pellets were lost from the pattern of a load due to their flattening from contact with the inside of the barrel. The deforming of the pellet spheres destroyed their aerodynamic soundness, sending them flying off at haphazard angles, outside of the effective pattern of the gun. The choice of a full-choked gun helped to put more pellets in the center of the pattern, thus compensating somewhat for the "lost" shot. This was achieved, of course, at the expense of a narrower effective pattern.

Modern plastic shot sleeves protect most of these outer pellets in the shell from being deformed as they pass through the barrel. Hence, full chokes are not necessary to compensate for lost shot, since the outer pellets are not deformed. Guns throwing wider, more open patterns with modern shells will contain just as many pellets in the pattern as choked barrels. The only difference is that they will cover more territory, and thus increase chances of killing game. And while the density of the pattern of an open barrel will not be equivalent to that of a choked gun, it will be far more dense than actually necessary to kill upland birds at ranges up to 30 or 35 yards—the range at which 90 percent of your shots will occur.

The advantage of this wider pattern cannot be emphasized enough. Most people just aren't as good a shot as they would like to think, especially beginners. It most forms of upland gunning, where point, lead, squeeze off and follow through must be performed in a matter of two or three seconds, often in dense, cumbersome foliage, getting the center of the gun's pattern on a bird which may decide to angle the opposite direction at any moment is well nigh impossible.

The majority of kills come from pellets on the periphery of a pattern. This is a fact which must be faced. And when one faces it, it becomes clear that the wider the pattern, the more game will be bagged (up to a point, of course.)

I did some tests with a few old shotguns, patterning them before and after removing the choked portion of the barrel. The increased diameter of the pattern at close shooting ranges was confidence instilling information. The width of the pattern thrown by the shortened guns at distances of 10-30 yards was increased as much as 1½-2 times the width of the original pattern. The increased *area* covered by the altered gun is even more dramatic, yet the pattern still remains dense enough for clean killing.

Another benefit of open barrels is the reduction of "stringing." This is the phenomena of shot "stringing out" and arriving at the target later than the bulk of the shot load. Needless to say, this reduces the effectiveness of the shotgun. If the strung out shot arrives at the target point *after* the bird was there, it won't do him much harm.

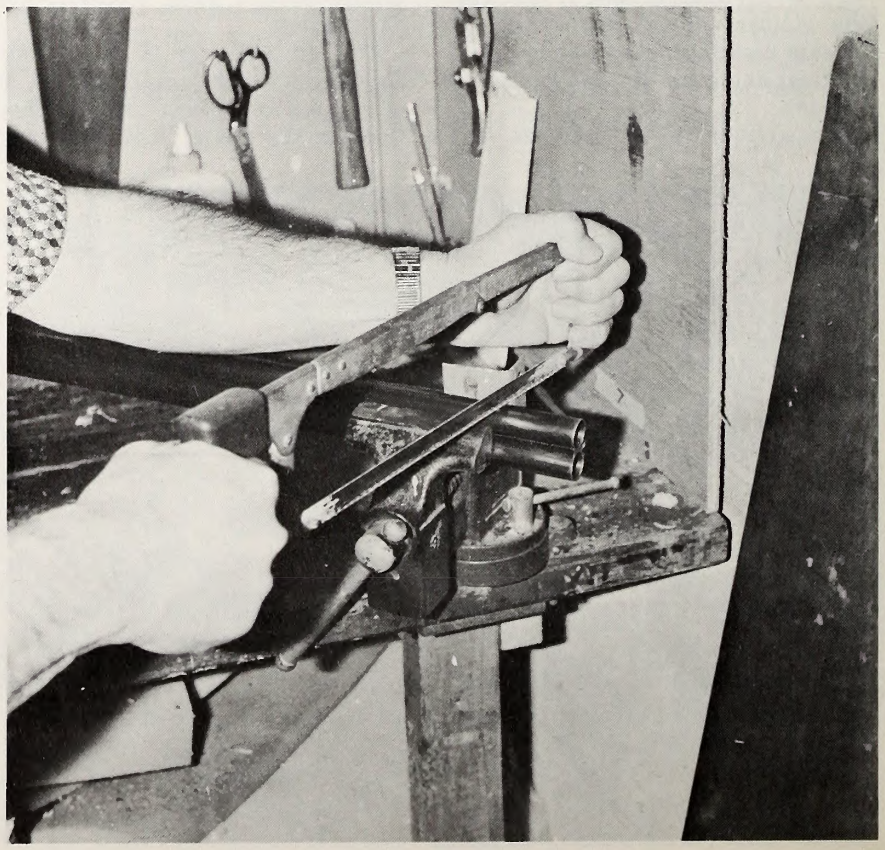
The actual shortening of the barrel is a simple procedure. Tighten the barrel in a vise with a piece of angle iron or similar object fastened next to it to act as a guide for the hacksaw blade. This will insure a straight cut. Measure off three-five inches, depending upon what length barrel you have and what length you want. For single shots and double barrels, 24 inches should be about the minimum. Shorter than this and the range of the gun will be unduly short. I find 25 inches a good all-around length for most of my upland guns. This often means cutting off three-five inches.

Cut the barrel with a fine-toothed hacksaw. Clean up the rough edges with a file first and then with steel wool. Oil well to prevent rust, or touch up with bluing, if desired. Three inches will be enough to remove the choked portion of most gun barrels. Any further shortening will be strictly for easier handling and cutting down on weight.

No one is suggesting that this procedure be applied to your uncle's $1,000 shooting piece. This is strictly a lowcost means to attain an open choked gun for unpretentious, country gunning. If you can afford to buy a new gun at the drop of a hat, by all means get a proper skeet bored double or automatic.

If, however, you want to make something useful out of that old gun gathering dust in the closet, or that menace which spoils your upland bird hunting trips needlessly, and it's not a terribly valuable gun anyway, why not try a little hacksaw mechanics? I think you'll be glad you did when your bird kills begin to skyrocket. ⬍

It takes a bit of determination to make that first cut, knowing that there is "no return," but it has worked for the author and many other hunters. Take the sawing slow and easy for a neat job. You may want to touch up the bluing, too.



NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

Nature Photography Contest

Word has just been received that the N. C. Museum of Natural History is conducting a Nature Photography Contest. There are three categories: 35mm color slides, color prints, and black and white prints. There is a $2.00 entry fee per category, and each entry must have the name and address of photographer and title of photo (use back of print or margin of slide). All prints must be mounted for exhibit. Deadline for receiving entries is February 18, 1976. Pack carefully and mail to David Lee, Chairman, Nature Photography Contest, N. C. State Museum of Natural History, 101 Halifax Street, PO Box 27647, Raleigh, NC 27611. Grand prize, $100; 1st, 2nd and 3rd Prize in each category, $50, $25, and $15.

National Wildlife Week

It's time to plan your observance of National Wildlife Week, March 14-20. The theme this year is "Save our Wetlands," certainly one of the most important problems facing our state and nation. Teachers' and Leaders' Kits are available from Wildlife Week State Chairman, George Batts, RFD 3, Box 127, Fuquay -Varina, 27526.

Colonial Birds

If you are working with birds that gather or nest in colonies, or if you have access to such a colony, please write for further information and a supply of field survey cards to: Director, Colonial Bird Register, Cornell Laboratory of Ornithology, 159 Sapsucker Woods Road, Ithaca, NY. 14853. Your help will be appreciated.

Turkey Hunters Take Note

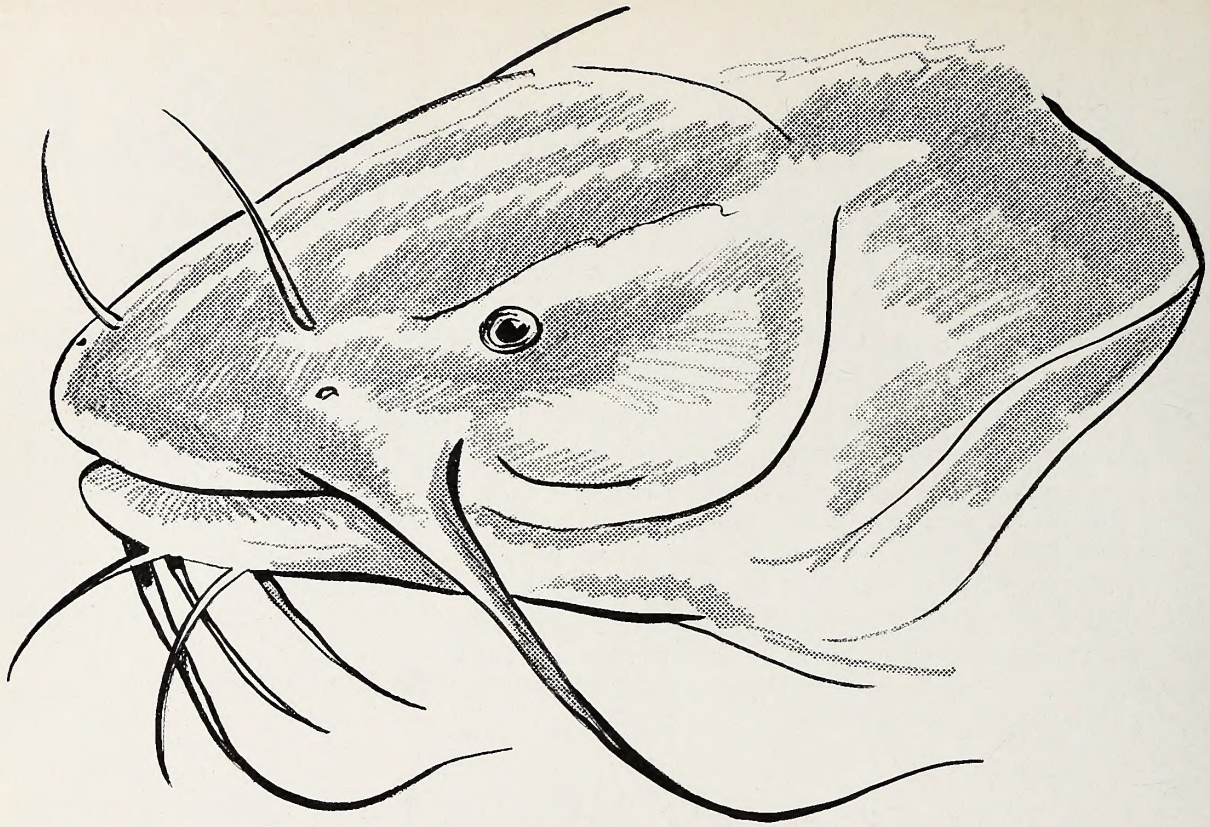
The North Carolina Chapter of the Wildlife Turkey Federation is holding a business meeting and election of officers February 14, 1976 at 4 p.m. at the Hilton Inn, Hillsboro St., Raleigh, N. C. Prospective members and interested folks are invited. On March 6, the Chapter will conduct a turkey calling contest, banquet and auction of wildlife art work and other items at the Western Alamance High School located 5 miles north of Burlington, N. C. For further information about this event, contact Secretary-Treasurer of the Chapter, Harold Herman, P.O. Box 281, Hickory, N.C. 28601.

One More Time

Boaters are reminded that this year, all motorboats used on the public waters of the state are required to be numbered. Check the January 1976 issue of WILDLIFE for details.

Outdoor Sports Organization for Women Formed

The nation's first outdoor sports organization for women, OUTDOOR WOMEN, has been formed and is headquartered at 500 12th Street, SW, Suite 810, Washington, DC 20024. It has an impressive executive committee which includes Joan Cone, well-known author and hunter (October 1975 "Wildlife"). For information, write the above address, attention Mrs. Cone.



BULLHEADS

by Fred A. Harris
Fishery Biologist

"They stay near the bottom, moving slowly about with their barbels widely spread, watching for anything eatable. They will take any kind of bait, from an angleworm to a piece of tomato can, without hesitation or coquetry, and they seldom fail to swallow the hook."

The above statement was made by Henry David Thoreau in describing the group of fishes known as bullhead catfish. Also referred to as mud cats, horned pouts, and yellow bellies, these fish are widely distributed throughout the United States and thrive under a variety of conditions. Although often overlooked by fishermen, bullheads can provide good sport as well as excellent table fare.

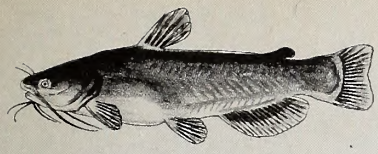
As a group, bullheads can be separated from other catfish by the shape of the caudal (tail) fin. Bullheads have a rounded or emarginate caudal fin as opposed to channel, blue, and white catfish, which have forked caudal fins. Flathead catfish also have a rounded caudal fin, but have a much larger adipose (that little fleshy fin on the back near the tail) fin than bullheads. In addition, the band of teeth in the upper jaw of a flathead forms a broad "U." The corresponding band of teeth in the bullheads is in the form of a straight line.

Distinguishing between the different species of bullheads is more difficult. Five species are known to inhabit North Carolina waters. These are the brown, yellow, black, snail and flat bullheads. From their names it appears that some could be separated by coloration. However, coloration is often determined by the water the fish inhabits and thus is not a good character for species identification. Instead, identification is dependent upon such characters as anal fin (the rather long fin on the underside of the fish nearest the tail) ray numbers, color of the chin barbels and median fins, shape of the caudal fin, and serrations on the spines of the pectoral fin just back of the head.

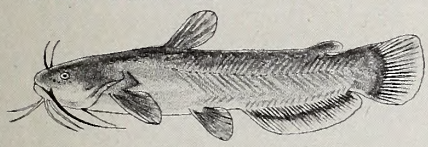
The brown bullhead (*Ictalurus nebulosus*) is distinguished from the other bullheads by having 20-24 anal fin rays, dark chin barbels, a square or slightly indented caudal fin and strongly serrated pectoral spines. This species is common in all streams and lakes east of the mountains, except the Lumber River system where it is rare. Maximum size of the brown bullhead is six-seven pounds.

Yellow bullheads (*Ictalurus natalis*) have 23-27 anal rays, white chin barbels, rounded caudal fins, and sharp serrations on the pectoral spines. While relatively rare in Piedmont lakes and streams, they are abundant in sluggish waters and lakes in the Coastal Plain. Maximum size is about 18 inches and three pounds.

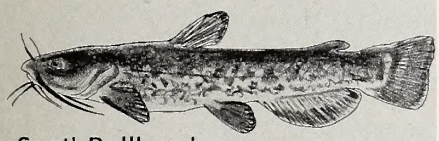
The black bullhead (*Ictalurus melas*) is characterized by having 17-24 anal rays, dark chin barbels, a square caudal fin, and weak serrations on the pectoral spines. This species is relatively rare in North Carolina. It has been reported in



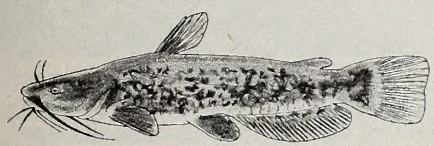
Black Bullhead



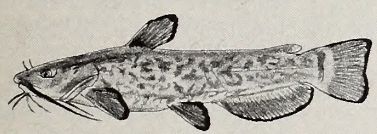
Yellow Bullhead



Snail Bullhead



Brown Bullhead



Flat Bullhead

streams in the French Broad River system, Highrock Lake, Lake Lure, and Belews Creek Lake. Black bullheads are very popular sport fish in the northeastern and midwestern states and have a maximum size of about two pounds.

The flat bullhead (*Ictalurus platycephalus*) has 21-24 anal rays, a narrow black margin around all median fins, and a prominent black band across the lower third of the dorsal fin. The species is rare to common in streams and lakes of the Piedmont and upper Coastal Plain. Maximum size is about two pounds.

The snail, or green, bullhead (*Ictalurus brunneus*) was long considered a form of the flat bullhead. However, it is now classified as a distinct species and is separated from the flat bullhead by having only 17-20 anal fin rays. Snail bullheads are rare to common in hard bottom, rocky streams of the Piedmont and upper Coastal Plain from the Cape Fear River south. Maximum size is about two pounds.

Bullheads are spring spawners with the possible exception of the snail bullhead, which may spawn year round. All reach sexual maturity in three years when they are usually 8-11 inches long. Nests are constructed in shallow water 1-4 feet deep and the female deposits 2,000-15,000 eggs. The eggs hatch in 5-10 days, depending upon water temperature and the parents guard the young for several weeks. It is not unusual for the parents to clean the eggs and young fish by sucking them into the mouth and then blowing them back out. As the young get larger, the parents may continue to suck them into their mouths, but discontinue blowing them back out.

As Thoreau pointed out, the diet of the bullheads is extremely varied. Insects, crustaceans, mollusks, worms, plant matter, frogs, fish eggs, fish, and maybe even an occasional tomato can are consumed. Most of the feeding is done near the bottom and frequently in shallow water. Although they are most active during the evening and night, feeding also may occur throughout the day.

The sundry diet of the bullheads allows anglers a wide selection of baits. The common earthworm is one of the better choices. Commercial or homemade "stink baits," crickets, liver, shrimp, and minnows also are very effective. Regardless of the bait used, it should be impaled upon a long shanked hook. Bullheads are noted for swallowing the bait and the long shank greatly facilitates freeing the hook from the fish. Sizes 1/0-3/0 long shanked hooks are preferred by most serious bullhead anglers.

Other than long shanked hooks, no specialized tackle is involved in bullhead fishing. Any rig from a cane pole to ultralight spinning gear will prove acceptable. The important thing to remember is that bullheads feed near the bottom. Therefore, enough weight should be added to the line to keep the bait in their feeding zone. However, the weight should not be such as to interfere with a fish swimming off with the baited hook. Since it is almost unheard of for a bullhead to "nibble" at the bait, bobbers are not necessary to detect a bite.

Finding a place to catch bullheads should be a relatively easy matter for most North Carolina anglers. Almost all of the Piedmont and upper Coastal Plain rivers and creeks have fishable bullhead populations. The larger streams usually hold the larger sized fish, but many of the smaller streams support high numbers of 6-10 inch fish. Although possibly not as numerically abundant as in streams, bullheads in small lakes and reservoirs tend to be larger than their stream counterparts. Some of the best bullhead fishing can be found in the municipal water supply lakes of the Piedmont. Brown and flat bullheads averaging one-two pounds are common in these waters.

Because of their ability to thrive in waters of low quality, many people associate bullheads with muddy, polluted water and overlook their excellent eating qualities. When caught from relatively clean water, bullheads compare very favorably with their more celebrated cousin, the channel catfish. The fish should be iced soon after capture to prevent the flesh from acquiring a mushy texture, but otherwise no special care or preparations are necessary. Any of the catfish recipes can be used in preparing bullheads. For those who may not be experienced catfish chefs, a couple of basic recipes are listed below.

Fried Bullheads

Prepare a batter by mixing the following ingredients:

2 eggs
½ teaspoon sugar
4 tablespoons of flour
enough milk to give a creamy consistency

Dip fillets of fish in batter and fry at 375-400°F until the fish are crisp on the outside and flaky on the inside (usually 2-4 minutes depending upon thickness of fillets). Allow ½ pound of fish per serving.

Bullhead Stew

2 slices bacon
1 large can tomatoes
3 potatoes, diced
1 onion, chopped
1 tsp. salt
2 tbsp. Worcestershire sauce
¼ cup catsup
½ tsp. thyme
1 cup hot water
1¼ pounds skinned bullhead fillets, cut up into bite-size pieces

Fry bacon, drain on paper, and crumble into saucepan with onions. Brown onions lightly and add all other ingredients except fish. Cover and simmer for 30 minutes. Add fish and simmer for 15 additional minutes uncovered. Makes 3-4 servings. ◆

PHOTO BY DAVID SMART

SWAMP BEARS of Dare County

by David M. Hardy
Athens, West Virginia

BLACK bears resemble humans in many ways. Some are aggressive, some easily frightened. Some are homebodies, others roam. Like people, they all require the same necessities of life: food, shelter, living space, and others of their kind to interact with. I spent a year studying black bears in the swamps of mainland Dare County, trying to determine exactly what their life requirements are (See *Wildlife in North Carolina,* May 1974).

This research began in 1972 when the North Carolina Wildlife Resources Commission (NCWRC), in cooperation with North Carolina State University (NCSU) and the U. S. Fish and Wildlife Service, began to study North Carolina's coastal swamp bears. A sense of urgency was added by reports from biologists, wildlife enforcement officers, and concerned citizens that bear numbers were declining in portions of North Carolina's Coastal Plain.

Besides initiating a research program, the NCWRC established 28 bear sanctuaries across the state with 17 located in the eastern region. These refuges are helping local bear populations maintain themselves at viable levels. The ongoing bear study (now centered in Bladen County) is providing information to help the NCWRC evaluate the effectiveness of present refuges, establish optimum sizes and ascertain vegetative types needed in future sanctuaries.

Data on bear movement patterns, seasonal food habits, population levels, reproduction, and periods of dormancy are being collected. These facts are needed by wildlife managers so they can modify the interactions of bears and men to achieve the maximum possible use and enjoyment of this natural resource by the public, without resource depletion. For bears, this means regulating and controlling hunting seasons and bag limits, establishing sanctuaries where bears may be viewed by the non-hunting public, adopting procedures to deal with nuisance or depredating bears, and controlling illegal kills. It also means supporting a basic research program to provide facts about continuously changing bear populations.

As a Master of Science candidate in Wildlife Management, I was hired to study swamp bears on a 150,000 acre tract in mainland Dare County, beginning in March 1973 and ending with February 1974. I captured four adult male bears in foot snares, sedated them, and fastened radio collars around their necks (Hardy 1974). These bears were tracked using a variety of antennas, and their seasonal movements were plotted on maps.

My assistant and I established a 60-mile track census route to gather data on bear population characteristics and movement patterns. About once each week we slowly drove this set of logging roads, searching for tracks, droppings, torn logs, trails, or any other sign of bear.

Tracks were measured and recorded. Places where bears entered or left the road were markd with flagging. We returned to flagged sites and examined the vegetation in adjacent woods in an effort to determine the types of cover bears prefer. We recorded distances traveled on roads and noted any additional information the tracks yielded concerning bear habits and activities. From the track data, we estimated numbers of adult male, adult female, and juvenile bears, and identified bear cover type preferences. Tracks were not distinctive enough to permit identification of individual prints (Hardy 1975).

Bear scat locations were also recorded, and the droppings collected and preserved. NCSU scientists identified the food remnants in each scat. Totaling these findings by month gave us bear food preferences for each season. Scats found at times other than during census runs were not included in bear movement data, but did provide food habits material.

In addition to roadside vegetative transects at entrance and exit points, 40 additional transects were surveyed at randomly chosen locations within the study area to determine the correlation between understory plants and overstory tree species in relation to bear use. This was done so that wildlife managers could look at a forest cover type map (showing overstory species) and have a good idea of the particular understory plants which accompany each overstory type.

The degree of movement of Dare bears appeared similar to that reported by other bear researchers. In general, adult males are the most wide ranging, followed closely by juvenile males. Females, especially females with cubs, occupy much smaller ranges. An adult male radio-tagged in May used an observed range of 65-70 square miles or over 42,000 acres, in a 10-month period. A female tracked in Onslow County by U. S. Marine Corps personnel at Camp LeJeune utilized a range of six-eight square miles or about 4,500 acres (See *Wildlife in North Carolina,* July 1973).

Bear movements changed with the seasons. Spring and summer movements were extensive, due primarily to foraging for relatively scarce foods and to the onset of the breeding season which peaks in early July (Erickson, et al. 1964). One male occupied an area of only six square miles during the fall months of October and November. He probably chose this area because it contained large numbers of black gum trees

Although "swamp bears" utilize a variety of habitat types in the area studied, wet, forested situations seemed to provide the elements of seclusion and food preferred by bears. Such areas must be saved.

which bear fruit at that time of the year. Winter movements were even more curtailed. One adult male appeared to enter dormancy in mid-November and maintained this state until the end of February, 3½ months later.

Bears used all major cover types but their cover type preferences, in descending order, were forested areas, older burns, more recent burns, and clearcuts. Preferred range contained diverse and generally dense habitat types, and few roads.

Movements seemed to be closely linked to food availability. Spring foraging was opportunistic with foods such as ants, leaves, and greenbrier berries noted in scats. Greenbrier berries are one of the few fruits that persist through the winter. With summer came the ripening of blueberries, the first large feast of the year. Switchcane tops and ants were also consumed at this time. Fall foods were predominantly black gum fruits, augmented by a few roots, leaves, greenbrier and gallberries. Winter foods consisted principally of greenbrier and gallberries.

Dare County bears fed primarily on vegetative matter and preferred high energy fruits and berries. Carrion, ants, and grubs when they could be found, provided protein. Although small amounts of corn, blackberries, wild grapes, and pokeberries were available, none of these foods were noted in scats. They are all prime bear foods elsewhere.

The evidence indicated a study area bear population of 25 to 35 individuals. Of these, 13 to 20 were adult males, four to eight adult females, and five to nine juveniles under four years of age. If, in fact, the study area harbored 30 bears, the population density was one bear per six square miles. This is much lower than one bear per 1.1 square miles, the density postulated by Stickley (1957) for the Dismal Swamp region, only 70 miles north of Dare.

Age structures of black bear populations in North Carolina determined by tooth sections from hunter kills indicate a preponderance of juvenile males in the yearling age class which comprises the majority of the kill. The older age classes show more females than males indicating a greater survival of females and a longer life expectancy. This is fortunate since females do not reach sexual maturity until their third summer. In Dare County, excessive hunting pressure associated with increased access through road construction may have been the mechanism for reducing bear numbers. Use of dogs, four-wheel drive pickups, walkie-talkies, bait stations, and road smoothing drags (to locate fresh tracks) all resulted in a highly efficient, highly coordinated hunting effort. Additional bear mortality also occurred through road mills, poaching, and natural causes.

To recover quickly from excessive mortality, a population must achieve high reproductive attainment. Unfortunately, bears have a low reproductive potential, with each adult female producing only two cubs every other year, an average of only one per year. The young generally do not mate until they are three and one-half years of age. Obviously, a population unbalanced in favor of males will take much longer to recover than would one with a more evenly balanced sex ratio. An animal such as the black bear which has a low reproductive potential for growth requires several years of complete protection to rebuild its population to a level where a short hunting season can be permitted without endangering its brood stock.

The Future

Local legislation currently prohibits hunting bears in Dare County. Plans of the principal landowner involve conversion of perhaps 60 percent of mainland Dare to farmland. The remainder will be blocks of swamp hardwods mixed with a few pines in the deeper and wetter peat soils on the periphery of the penisula. Bears should be able to survive in such an environment if future hunting is carefully controlled and if mortality resulting from bear depredation is minimal.

Black bears are tough and independent individuals that seem well adapted to life in the dense pocosins of eastern North Carolina. We can retain these unique and valuable animals for our great-grandchildren to enjoy provided that we leave a few roadless swamps and mainland bear mortality at a level consistent with their optimum population by carefully controlled and strictly enforced hunting regulations. Given this degree of protection, these rugged animals will continue to make eastern North Carolina their home.

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Stem to Stern

BY ED JENKINS

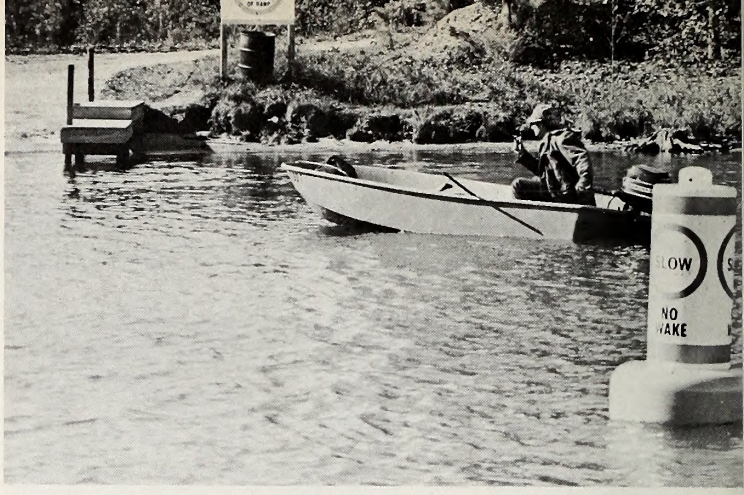

PHOTO BY REX GARY SCHMIDT

There are good reasons for signs such as these "no wake" notices. They are placed around boat landings, docks, and access areas where boat traffic is often high. Slow down.

• One sunny day this spring or summer you may hitch up your boat to the family automobile and travel to one of your favorite boating areas to take the kids water skiing only to find a big disappointment awaiting your family. Those canals or areas where the kids used to enjoy skiing so much are now posted with signs stating "SLOW—NO WAKE."

"How can this be?" you may ask. "Why can we no longer ski here?" The answer is quite simple. A small number of unthinking, discourteous people, let's call them the water cowboys, have so aroused the other recreational users in that area that boating law enforcement officers and boating law administrators were forced to act to assure public safety.

Who is a water cowboy? He can best be described by some of his particular habits. He is the one who buzzed your pier and sprayed water over you and your family.

He is also the one who came dangerously close to your kids while they were swimming. His excuse, "Those kids shouldn't be swimming there anyway. They are too hard to see."

The water cowboy is also the fellow with the high performance boat who weaves in and out among fishing boats showing how maneuverable his boat is.

He is the boat operator who has no regard for his wake as it slams other boats tied to piers against themselves and the dock. If his wake capsizes a small fishing boat, so what, it shouldn't be out there anyway.

These are just a few of the antics that are making power boating unpopular. You can probably think of many others you have witnessed that can be added to this list.

Boating is one of America's fastest growing recreational activities. Over 47 million people go boating each year in this country. The vast majority of these boaters are good boat operators; however, there are those few individuals whose disregard for laws and the rights of others jeopardize the privileges most of us enjoy. Whenever careless boat operation in an area endangers the lives and property of others, then regulations curtailing those boat operation practices must be considered. If boating is to remain safe, enjoyable and relatively free of regulations, many of the old boating practices must stop now.

"What can I do about the situation?" you may ask. First of all, be sure your boat handling does not brand you a water cowboy. When you let a member of your family use your boat make sure he not only has the skill to operate the boat but also understands the responsibility of operating the boat in a safe and courteous manner. If you know anyone who is operating a boat in a reckless manner, talk to them. If this does not work, contact your local water enforcement officers and let them handle the situation.

The individual boat operator is the key; he must accept the challenge. The future of recreational power boating is in his hands. ⬍

Some fun, huh? No, not really, plus creating a real danger to the fisherman in the small boat. The waters of our state are for all its citizens to use, safely. It may be that our water manners need some careful examination, and some straightening up; some day you may be in the "other boat."

- Letters
- Comments
- This & That

BACK OF THE BOOK

Most of us get a little tired of hearing anti-gun, anti-hunting people spout off their arguments against hunters in general and guns in particular. Certainly hunters may have "eliminated" a species or two in the distant past, but no one seems to have come up with actual proof.

The last hairy mammoth or mastodon was probably done in by half-starved and half-frozen cave men; but the critter probably would have frozen to death from the southward advance of the ice age.

So next time someone tries to give you a hard time about being a hunter, quote a few of these items assembled by the Wildlife Management Institute:

To appreciate the present, one must understand the past. Around 1900, most authorities did not have much hope for any of the larger forms of wildlife surviving far beyond the 1920's. This pessimistic view failed to foresee the scientific wildlife management programs that developed in the early 1930's and which have been expanded through subsequent decades. Here are a few historical comparisons:

- Beaver: **1900**—Eliminated from the states of the Mississippi Valley and all eastern states except Maine: common only in Alaska and a few localities in the Pacific Northwest and Rockies. **Today:** Common to abundant in nearly all states except Hawaii.

- Pronghorn Antelope: **1925**—Authorities estimated 13,000 to 26,000 in U.S.A., most in Wyoming and Montana. **Today:** Minimum population in all western states is 500,000.

- Bison: **1895**—800 survivors. **Today:** Population about 6,000 in U.S.A.; all available range fully stocked.

- Elk: **1907**—Common only in and around Yellowstone National Park; estimated total south of Canada, 41,000. **Today:** About 1 million in 16 states.

- White-tailed Deer: **1895**—About 350,000 south of Canada; extirpated from more than half the states. **Today:** Approximately 12 million in 48 states.

- Wild Turkey: **1930**—Common in only a few southern states, eliminated from most. **Today:** Restored to 43 states, including establishment in several outside original range of species.

- Fur Seal: **1911**—Official census in Pribilof Island showed 215,900. **Today:** Herd maintained at around 1.5 million under a scientific management program.

- Egrets and Herons: **1910**—Several species on the brink of extinction because of slaughter on their nesting grounds by feather collectors to supply the millinery trade. **Today:** Most species common to abundant over most of the United States.

- Trumpeter Swan: **1935**—73 survivors south of Canada on one wildlife refuge. **Today:** Thriving populations on two national parks and several national wildlife refuges. Removed from endangered status in the late 1960's.

- Wood Duck: **1915**—Greatly reduced in numbers and considered a candidate for early extinction. **Today:** The most common breeding waterfowl in eastern U.S.A.

- Sea Otter: **1907**—Nearly extinct; a few survivors in Alaska's Aleutian chain and in coastal California. **Today:** Minimum of 50,000; successfully restored to waters of mainland Alaska, Oregon, Washington, and British Columbia, increasing and extending range in California.

Since 1938, state fish and wildlife agencies have used sportsmen's license fees and special taxes under the Federal Aid in Fish and Wildlife Restoration Act to:

- Acquire, develop, or manage 2,900 wildlife refuge and management areas totalling nearly 40 million acres. These lands protect vital habitat of a wide range of wildlife and are heavily used by bird watchers, nature students, and other outdoor enthusiasts.

- Construct or restore more than 300 lakes for fish and wildlife with a total surface acreage of 35,000.

- Acquire or develop more than 3,000 public access areas that open nearly a million otherwise inaccessible acres and 2,000 miles of stream to outdoor recreational use.

- Livetrap and transplant to unoccupied habitat more than 50,000 deer, 16,000 antelope, 2,000 elk, 1,000 mountain sheep, 10,000 fur animals, 20,000 wild turkeys, 22,000 waterfowl, and 130,000 quail.

- Conduct extensive research on wildlife habitat needs, diseases, population trends, predator-prey relationships, and wildlife crop-damage abatement.

Wood ducks have made a comeback, thanks to careful management including nest boxes.

Shad Fishing's First (And Last?) Book

I have just finished reading a new book that I'd like to recommend to North Carolina's fishermen. The book is "Shad Fishing," written by C. Boyd Pfeiffer and published by Crown Publishers, Inc., 419 Park Avenue South, New York, NY 10016. The price is $8.95.

Let me say at the outset that this is not only a recommendation for Pfeiffer's book, it's also a recommendation for shad fishing. I enjoy lots of kinds of fishing, but shad fishing is one of my favorites —and with good reasons. Shad are numerous in our coastal rivers in March and April each spring when they run upstream out of the Atlantic Ocean to spawn. When conditions are right, you can catch them by the dozens. Not only hickory shad, but also the much

KNOW YOUR ENFORCEMENT OFFICER

Enforcement Officer Garland H. Hallman, Jr., was born October 9, 1942 in Cherryville, N. C. Protector Hallman is the son of Mrs. Marjorie R. Hallman and the late Mr. Garland H. Hallman, Sr., of Cherryville. Garland graduated from Cherryville High School.

Garland completed the Basic Recruit School for Wildlife Protectors at the Institute of Government, Chapel Hill, N. C. in June 1968. He was employed as an Assistant Wildlife Manager on the Daniel Boone Game Lands August 1, 1968. In August 1970 he was promoted to Manager 1 and moved to the Sandhill Game Lands at Hoffman, N. C. On December 1, 1971 he was transferred to the Division of Protection and was appointed a Wildlife Protector, living at Marston, N. C., in Richmond County.

Since his initial employment he has attended Basic In-Service, Investigative Techniques, Pursuit Driving, Defensive Tactics and Protector's Basic Eight Week Training School.

Garland is married to the former Elaine Boyd of Cherryville, and they have three sons, Ben age 12 and Henry age 6 and Kelley, 10 months. The Hallmans attend the First Baptist Church in Hoffman, N. C.

Garland H. Hallman, Jr.

larger white or American shad. These fish take artificials readily, and fight like miniature tarpon, leaping out of the water and taking line in long runs. The popularity of shad fishing in North Carolina has grown drastically during the past decade, and each spring, the sport attracts many new devotees.

Pfeiffer's book is so complete that it will be an invaluable aid not only to experienced shad fishermen, but also novices. It covers the interesting biology and life history of these fish, and even provides over 70 recipes for preparing shad, many of them originating from North Carolina's kitchens. There is also a section, complete with photographs, describing the proper method for filleting a shad.

Pfeiffer furnishes explicit information on the use of spinning, spin-casting, bait-casting and fly fishing tackle for shad, as well as the lures and flies which work best. One chapter furnishes dozens of fly patterns, although fly fishing for shad is not yet popular in this state. He also gives many tips on how, when and where to fish for shad.

One chapter lists the best spots in various states across the country. I could find only one mistake in the section on North Carolina, and that may be a typographical error. (Instead of listing Locks No. One, Two and Three as hotspots on the Cape Fear, it lists Locks One and 12. There is, of course, no Lock No. 12 on the Cape Fear).

The book is full of fine photographs, and the angler who has never fished for shad will certainly want to try them after he's looked at the photos even if he doesn't read a word Pfeiffer has written. If photos of shad leaping three feet out of the water don't pump some adrenalin, nothing will.

As I mentioned, the book is very complete and that will come as no surprise to anyone familiar with Pfeiffer's other fine, recent Crown publication, "Tackle Craft."

As far as I can determine, this is the first book ever published that deals strictly with shad fishing, and it may be the last. ⬍⬍

Indian Wisdom

Dear Sir:

I read with interest the letter reprint from Chief Sealth (Seattle) to President Pierce in 1855, which appeared on page 26 of the August issue of *WILDIFE IN NORTH CAROLINA*. I've seen the same letter reprinted in other state wildlife magazines, so it must be a popular contribution.

Many letters written by American Indian leaders to political, military and industrial leaders display a tremendous degree of intelligence and wisdom, yet American Indians essentially have never been welcomed in our society. Even today, their ways of life and thinking are regarded as nothing more than a "novelty" by many of us. Perhaps their unique wisdom has been too overwhelming for our pioneer ancestors to understand.

A more recent letter, from the Hopi Indians in Arizona to President Nixon in 1970, shows this same high degree of intelligence and wisdom, ignored even now by "leaders" in government and industry:

"The white man, through his insensitivity to the way of Nature, has desecrated the face of Mother Earth. The white man's desire for material possessions and power has blinded him to the pain he has caused Mother Earth by his quest for what he calls natural resources. And the path of the Great Spirit has become difficult to see by almost all men, even by many Indians who have chosen instead to follow the path of the white man . . .

"Today the sacred lands where the Hopi live are being descrated by men who seek coal and water from our soil that they may create more power for the white man's cities. This must not be allowed to continue for if it does, Mother Nature will react in such a way that almost all men will suffer the end of life as they know it. The Great Spirit said not to allow this to happen even as it was prophesied to our ancestors . . ."

Letter to President Nixon from the Hopi Traditional Village leaders, 1970, when the Peabody Coal Company began stripping coal from Hopi and Navajo tribal lands in Arizona and New Mexico.

It might be interesting to search

New Bird Book

This is a drawing of a screech owl by Chuck Ripper from THE PLEASURE OF BIRDS: *An Audubon Treasury* (Lippincott, $14.95), edited by Les Line. It contains the best articles on birds from recent issues of Audubon Magazine, written by such authors as Roger Tory Peterson, Brooks Atkinson, George Plimpton, Hal Borland, and Edwin Way Teale. There are 18 full-color photographs by Audubon photographers and 28 black-and-white drawings by Chuck Ripper. Ask for it at your local book store.

through old documents and communications between the Cherokee and other Indian tribes in North Carolina, to learn of their reactions and thoughts regarding our own ways and behaviour.

Respectfully,
Alan Brooks
Fort Collins, Colorado

New Trail

The newly constructed Neusiok trail in Craven and Carteret counties, North Carolina offers a variety of recreational experiences for hikers, hunters, birdwatchers, botanists and lovers of the out-of-doors. Designed, marked and cleared through cooperation of the U. S. Forest Service, the Weyerhaeuser Company, and the local Carteret County Wildlife Club, the 18 mile trail begins at the low salinity Neuse River estuary and traverses sandy beaches, hardwood ridges, cypress-palmetto swamps, pine flatwoods, pocosins (vast bogs peculiar to the Carolina coastal plain), and salt marshes before emerging at the high salinity Newport River estuary a scant five miles from the Atlantic Ocean.

Wildlife along the trail includes several rare and endangered species such as the southern bald eagle, alligator and the red-cockaded woodpecker, as well as abundant and more mundane creatures such as squirrel, otter, white-tailed deer, black bear and wild turkey. The nearly extinct eastern cougar has been reported from an adjacent county by reliable observers and possibly roams the vast woodlands through which the trail runs.

A unique attraction of the new trail is that hiking conditions are best when upland trails in most other areas are weather bound. Truly cold weather on the coastal plain is rare, with winter temperatures often in the high 60's and occasionally in the 80's. From October to May the brush is thinnest and the insects are fewest, but the periods of warm weather keep snakes active. Hikers should be alert for copperheads, canebrake and eastern diamondback rattlesnakes, and cottonmouths.

Logging roads intersect the trail sufficiently to provide segments of length and terrain to match all tastes.

For further information write District Ranger, Croatan National Forest, New Bern, North Carolina 28560.

BLADES from page 13

knife's value? Figures in the $5000 range were tossed around.

Quite frankly, I don't know who eventually bought the knife, or even if it was sold. Nor do I know what it might have been worth.

But I do know one thing, I'm going to confine my collecting to more modest investments for the time being. After all, that old knife was so dull it wouldn't even peel an apple!

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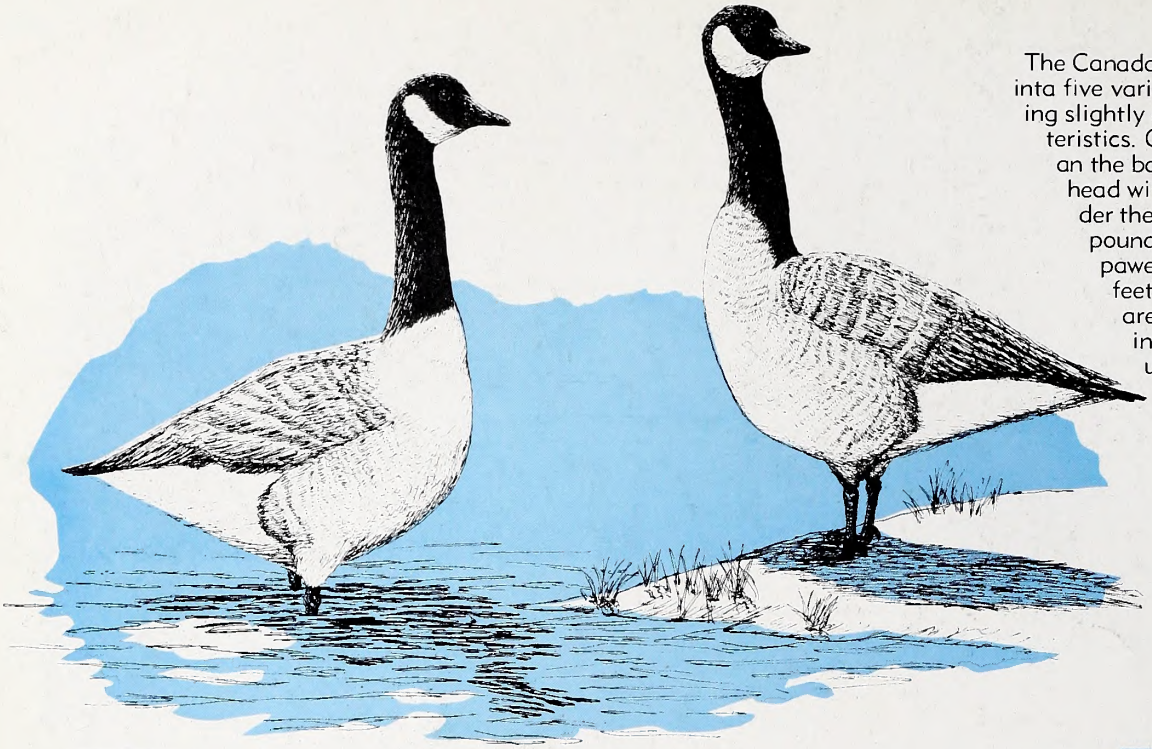
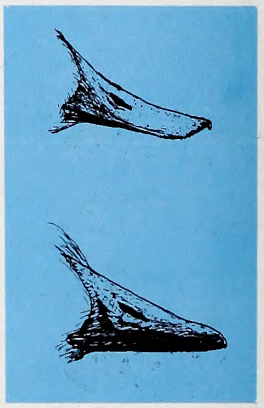


The Canada goose group is often divided inta five varieties or subspecies, each having slightly different color or size characteristics. General color is brown or grey an the back and sides, black neck and head with white checks and white under the tail region. Size varies from 6 pounds to over 12 pounds. They have pawerful wings with a spread of 5 feet ar more, and once in the air, are strong fliers. Canadas feed in fairly shallow water, tipping up and using their long necks to gather aquatic vegetation. They alsa do extensive feeding in corn fields and pastures.

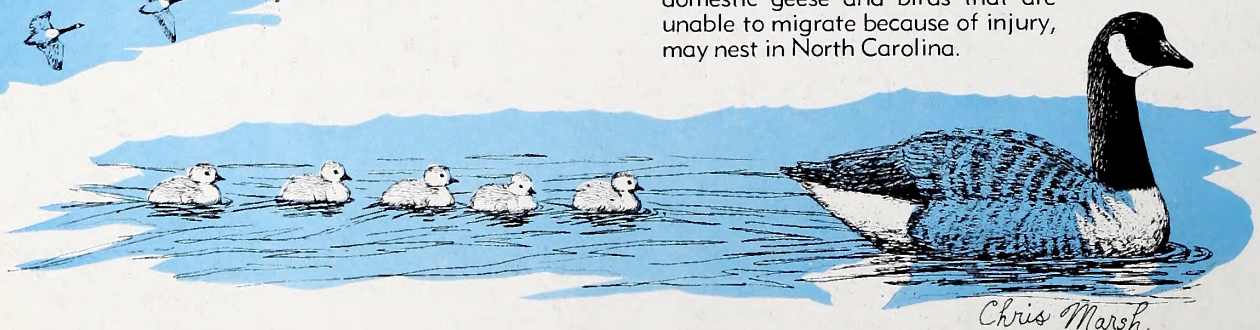
THE CANADA GOOSE

Althaugh the traditional V-shaped patterns are aften maintained in flight, long lines and small flocks also are used in their lang, cross-cauntry travels. Geese often fly at night, feeding and resting during the day. The lead gaose is usually the strongest flier of the flack, but the lead position may be "traded aff" at times.



The bill of the goase (lower) is heavier and shorter than the flatter duck bill (above). It is more suitable for pulling grass and other rooted vegetation.

Nesting takes place over a wide area of far northern Canada, the western one-half of Canada and the northwest one-fourth of the U. S. Semi-domestic geese and birds that are unable to migrate because of injury, may nest in North Carolina.



Chris Marsh

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Wildlife

IN NORTH CAROLINA

MARCH 1976

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PHOTO BY R. T. PUCKETT

Early Fisherman

It looks mighty cold, and it probably is. Be sure to use extra caution with small boats when the water is cold. We hope you have safe fishing whenever you go.

STATE OF NORTH CAROLINA

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NATURAL AND ECONOMIC RESOURCES
JAMES E. HARRINGTON, JR.
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Wildlife
IN NORTH CAROLINA ■

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VOL. XL NO. 3 MARCH, 1976

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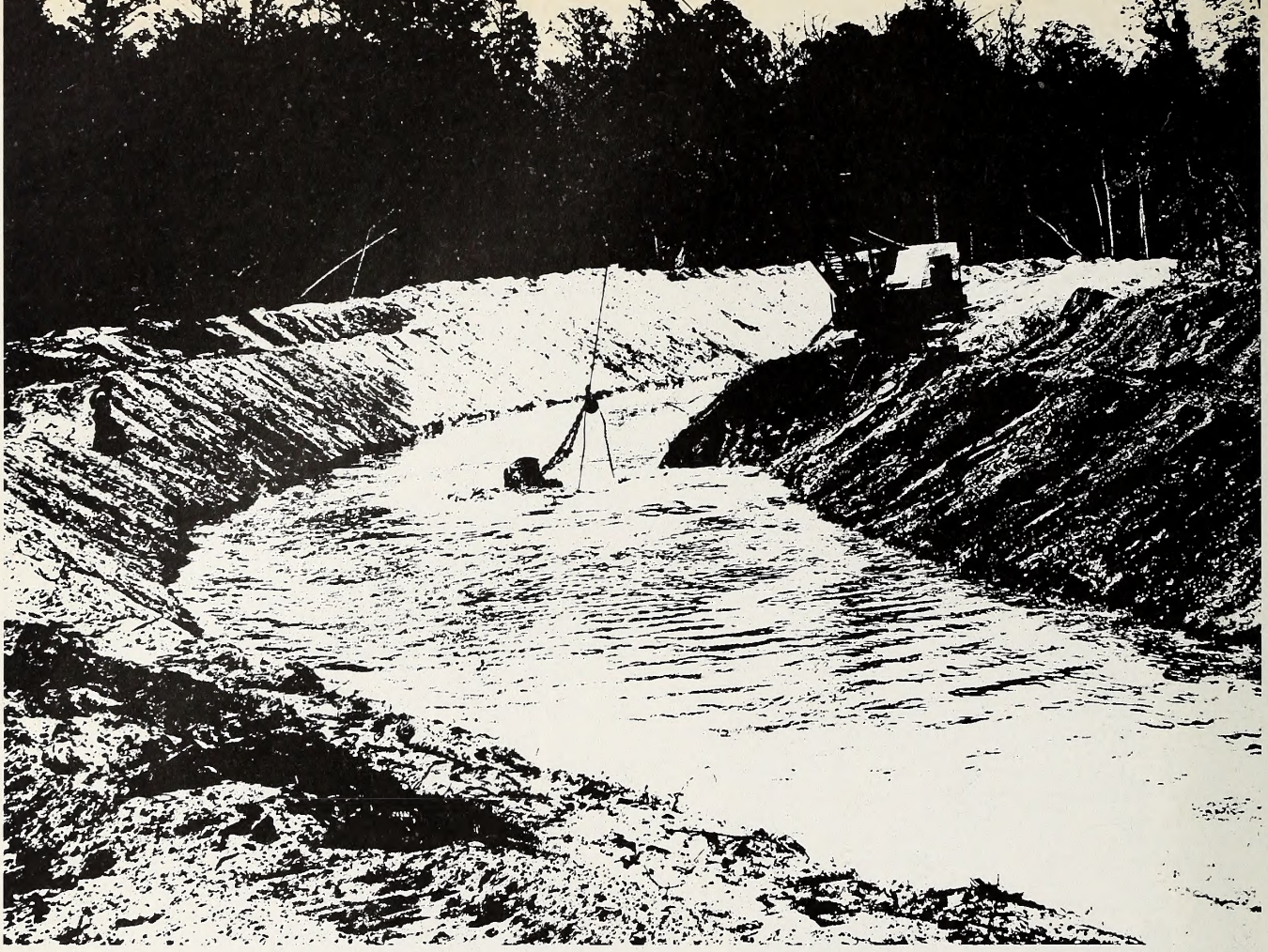
An objective of all levels of government should be to achieve and sustain a balance of the social, ecological, and economic benefits derived from natural resources. Without such balance none of the factors on the scale will be worth weighing.

The screech owl is about the size of a quail although may not weigh quite as much. But what it lacks in size, it makes up in noise. Its wide variety of eerie calls during the predawn hours is without equal in the animal world. Shown here is the "red phase." The gray coloration is common also. All hawks and owls are protected by law. Photo by Irvine D. Prather, Richard N. Conner, and Jerry W. Via.



North Carolina Wildlife Resources Commission
POLICY ON STREAM CHANNELIZATION

Channelization of streams for the purpose of flood control has been a highly controversial subject for the past decade. Conservation interests have become increasingly concerned because of the devastating impact of channelization upon streams and wetlands. In this statement, a rationale for the development of a State policy on this highly controversial issue is presented. This was endorsed by the North Carolina Wildlife Resources Commission at its meeting of January 26, 1976.

● Streams, floodplains and wetlands are basic components of the water cycle essential to life on this planet. Because of their natural productivity, and relative freedom from human encroachment, wetlands constitute some of our most productive wildlife habitats. Furthermore, clearing, farming and urbanizing of our uplands has increasingly preempted wildlife so that in many sections wildlife is largely restricted to wetland areas adjacent to streams and rivers. And now we find that largely as a result of federally sponsored programs and the world demand for more food, these last "natural refuges" are threatened with destruction.

Under the guise of "flood control," highly productive natural streams have been converted to wide, barren ditches, and associated swamplands have been drained. Ironically, most of this has been done with taxpayer's dollars under federal sponsorship so that we are using public moneys to destroy public resources, usually for private gain. Most of this destruction has been wreaked in the eastern part of our State, but inventories of projected work cover all parts of North Carolina.

The seriousness of this damage comes into sharper focus when we stop to think of the many ways that wetlands serve our needs. Wetlands moderate extremes in water flow and serve as natural flood detention areas. They aid in water purification and in recycling nutrients. Many serve as groundwater recharge areas. They function as nursery areas for aquatic animal species and are critical habitats for a

wide variety of plant and animal species, some of which have been depleted to the point that their very survival is endangered. Wetlands produce highly valuable crops of timber, fur, fish and wildlife. Many provide their owners with income through fees for hunting, trapping and fishing privileges.

Natural free-flowing streams, with their meanders, pools and riffles constitute habitat for a large variety of fish, furbearers and waterfowl. In their natural state they tend to be self-cleaning but many are in a deteriorated condition due to their use as dumping areas for man-made wastes. Hopefully, recently enacted legislation will restore their original clean quality, but measures must also be taken to preserve their physical structure currently under assault by the channelization process.

Proponents of channelization sometimes claim that flooding is more frequent today than in former years and to some extent they are right. We have always had floods, and always will in the future, but many activities of man contribute to increased frequency and severity of flooding.

Probably the most powerful causative factor resulting in more flooding is removal of forest cover. The forest canopy intercepts the impact of rain upon the earth and the forest floor acts as a huge sponge that holds the water in place and allows it to filter slowly into the ground. Even grassland has but a fraction of the water retaining potential of the forest floor. Cultivated land has less water retaining capacity than sodded areas while rooftops and pavements have none. Thus, *land clearing and urbanization, both progressing at an accelerating rate, are the two primary contributors to increased flooding.* In addition, according to Environmental Protection Agency studies, inadequate conservation practices on farmlands result in their contributing 50 percent of the silt load in our streams. Mining, urban land clearing, road construction and logging each contribute about 10 percent.

Increased development in floodplains is another reason for increased flood damage. In spite of the fact that our rivers are being increasingly impounded to prevent floods, inadequate restriction against construction in flood-prone areas results in much greater financial damage than in former years.

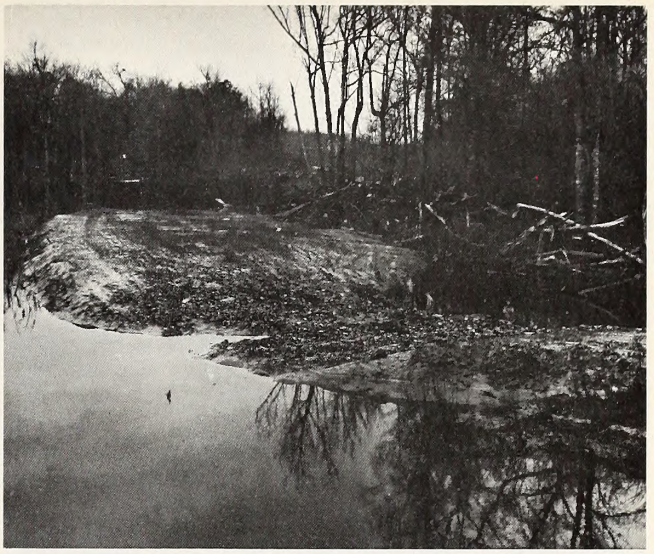
Still another factor, generally overlooked, is that most roads that cross low-lying areas are built on earthen fills that effectively dam the natural flow of surface and subsurface waters. Throughout much of our Coastal Plains, road-fill dams that cross swamps back floodwater into adjoining crop and developed lands, adding further to the demand for stream channelization.

To a lesser, but sometimes significant extent, trees felled into streams by loggers tend to impede water flow. But these, and trees that fall naturally into the stream channel, constitute but a tiny fraction of the impact resulting from land clearing and swamp damming by road fills.

In developing a solution to the channelization problem it is appropriate that we divert for a few moments to philosophical considerations and to the development of basic priorities.

First, and most important, we would propose that maintenance of the quality of life for our people should be much more important to us than to attempt to assuage the bottomless pit of world hunger. If the prime purpose of channelization is increased agricultural production and we follow it to its logical conclusion, we can soon destroy all of our valuable wetlands and still not solve the food shortage in India, Ethiopia and other nations that appear incapable of curtailing their ever-increasing hordes of starving humanity. To provide emergency food in case of crop failure is one thing, but to provide annually needed staples actually makes the problem even worse. We hold, therefore, that it makes more sense for us to maintain the quality of life afforded by the recreational opportunities provided by our streams and wetlands, and thereby serve as an example for others to emulate, rather than to depress ourselves to their level.

Second, and equally important, we should strive to develop our resources in harmony with natural forces, rather than to constantly strive to counteract them. Floodplains are subject to flooding and we should allow them to flood. The best way to prevent flood damage is to stay out of the flood zone. If we do develop in the flood zone we should recognize that it is a gamble, carefully weigh our chances, and be prepared to lose. For the long-term, it would be highly appropriate to convert all flood-prone lands to public



WILDLIFE COMMISSION PHOTOS

Too often in the past, channelization has resulted in stream habitat destruction as represented by the scene above. Many North Carolina streams are still "natural" and productive (below) and future plans should insure that they remain that way.

ownership. As part of the public domain, they could be dedicated to the conservation of timber, wildlife and water, thereby acting in harmony with nature, with all of the benefits derivable therefrom.

Third, in consonance with the above, it should be our policy to refrain from draining what remains of our depleted wetland areas and to allow them to function as natural flood detention reservoirs and producers of timber and wildlife. All things considered, such would undoubtedly constitute their highest and best use, with substantial contribution to the quality of life through recreational opportunity.

Fourth, we should declare unequivocally that our State policy is to maintain our streams in a natural, free-flowing, self-cleaning condition and in implementing this policy we should limit stream reclamation to those actions that serve to remove only man-made wastes and the results of natural catastrophes.

Fulfillment of these philosophical objectives can be accomplished by 1) reducing the need for channelization, 2) restricting the use of channelization, and 3) modifying the mode of channelization.

There are at least three ways that we can reduce the need for channelization. The most important of these is to place emphasis on land use practices that enhance infiltration rather than run-off of rainwater. This is necessary as it relates to all earth-moving activities but the greatest opportunities for improvement are probably in the area of agricultural practices since most of our nonforest lands are in croplands. Soil conservation in farming has made great strides but we still have a long way to go. For example, why, after 40 years of intensive soil conservation programs, do we still require that only 50 percent of the cleared lands in a watershed project be under conservation practices? Isn't it time that this ratio be raised to 75 percent or higher? Why shouldn't there be a commitment that all of the land in the watershed will be managed in consonance with established soil conservation practices, particularly if public funds are to be used to enhance private gain?

A second way to reduce the need for channelization is to identify flood-prone land and restrict its uses to those that are compatible with flooding. This can be done by enactment of zoning ordinances, withholding of insurance for unauthorized use, reduced tax rates for appropriate use, etc.

A third way to reduce the need for channelization is by maintaining free-flowing streams through enforcement of the prohibition against felling trees into streams and by removing obstructions that impede the flow. The first item is scheduled for accomplishment through legislative authorization recently provided the N. C. Forest Service. The second item would probably require the establishment of mobile monitoring and stream clearance crews.

The use of channelization can be restricted in several ways. First, we need to clearly distinguish between the need for flood control and land drainage. Where the primary purpose of treatment is land drainage, stream channelization should not be provided or allowed. Furthermore, streams should not be channelized to provide for farming on lands that are subject to annual flooding. As a matter of State policy we should establish a cut-off point, i.e., approve publicly-sponsored flood control programs only on lands that might be affected by a flood frequency of one year in ten (or 5 or 15). Hydrologists can delineate such areas and the only element that needs definition, as a matter of State policy, is the flood frequency against which publicly-sponsored projects may be designed. Lands which are subject to more frequent flooding should be considered as "belonging to the river" and dedicated to uses compatible with periodic inundation.

Where justification for stream channelization is protection of developed (urban) areas, authorities should recognize the inevitability of flooding by restricting development in adjoining undeveloped flood-prone areas and also recognize that the area already developed should, in the long pull, be dedicated to other uses.

Lastly, stream channelization should, ideally, be restricted to those reaches of stream where it can be demonstrated that the original stream channel has been filled due to human activity or natural catastrophes.

If, after satisfying all of the above strictures, the option to channelize is selected, the method or mode of channelization should be modified from past practice in the interest of stream preservation. The following guidelines are not presented as a means of preventing damage to the stream for it should be clearly recognized that any alteration of the stream channel has traumatic consequences upon the associated biota. However, if channel work is held within these specifications the stream will recover its fish and wildlife production potential in a much shorter period of time, and there will be a less severe impact upon associated wetlands.

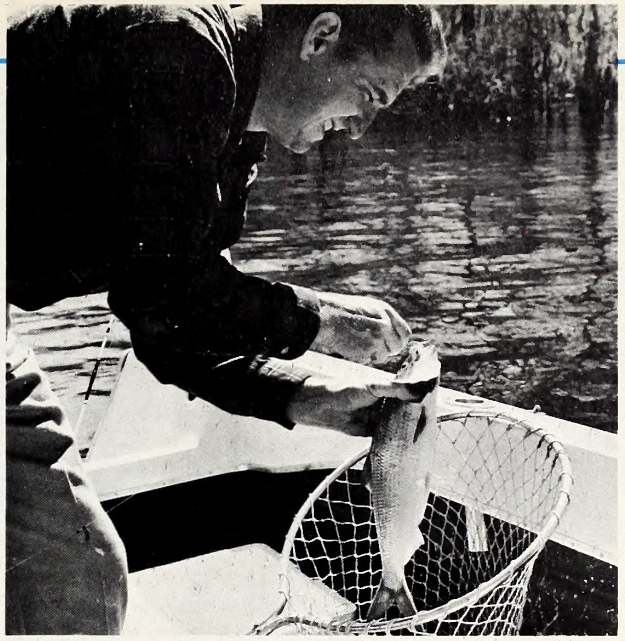
In consonance with the philosophical basis developed above, *the only justifiable objective of stream channelization should be restoration of original stream flow capacity.* Furthermore, this stream flow should be in the original stream channel with all of its meanders, pools and riffle reaches. Thus, stream channelization should be restricted to channel deepening, but not widening or straightening. Widening the channel almost always spreads the water too thin to support fish life. Maintaining the original meanders and width also helps to sustain the self-cleaning action of the stream. This is in strong contrast to the deep bed of shifting silt in most existing channelization projects in which the stream was converted into a wide straight ditch. Holding to the original width with its deeper water also means that the water will be cooler and conducive to production of fish and other desirable biota.

Rights-of-way for equipment operation should be on the north or west side of the stream bed and as narrow as possible—preferably not more than 50 feet wide—so as to maintain shade and provide for insect fallout into the water. Excavated material should be scattered away from the stream and not bermed. This will allow the stream to overflow into the adjoining floodplain or swampland in time of flood. This will also eliminate the need for seeding the right-of-way (except in open fields) since the native woody vegetation will very quickly re-cover the cleared strip. A cleared right-of-way is not necessary for maintenance purposes since the meandering stream will maintain itself clear of sediment.

In summary, these policies and procedures, based on natural principles and in harmony with natural forces, may result in some short-term costs, but the long-term benefits, to both public and private interests, are far greater. We would hope, therefore, that those who have final responsibility for establishing State goals and policies will take the long view in development of a State policy in channelization. ◆

High Jumping Shad Offer Fine SPORT FISHING

by Jim Dean



IF the hickory and white shad were available to fishermen all year, and not just in the spring, these fine sport fish would undoubtedly rank near the top of the heap in popularity—maybe even as high as the largemouth bass and the bluegill.

Well, perhaps that's a little bit of an exaggeration. Besides, it would strain even Ray Scott's imagination to come up with a slogan to fit an organization named S.H.A.D. (what about Shad Happy Angler's Delegation?).

Still, no matter how you slice it, both the hickory and white (or American) shad are great fun to catch each spring when they leave the ocean to spawn in the coastal rivers of North Carolina.

The smaller hickories (they average about a pound to a pound and a half) ascend the rivers first, and the first ones are usually caught in February. With favorable weather and water conditions, there are usually plenty of hickories being caught in early to mid-March with the run tapering off later in the month.

The larger white shad (averaging two and half to three pounds, but reaching well over seven in our waters) enter the rivers later and the peak of the white shad run may be anywhere from late March or early April on into early May depending upon where you fish.

Although some rivers have both hickory and white shad runs, one will usually be dominant.

The prime hickory shad river is probably the lower Neuse River; especially its tributaries: Contentnea, Pitchkettle and Grindle creeks. The hickory shad fishing on these creeks is so good at times that the town of Grifton stages an annual gala Shad Festival. It's a big event, and this year, it will be held April 9-10-11 (at which time the winners in the three-month long shad fishing contest will be announced).

Shad, either hickories, whites or both, are also found in the Chowan, Black, Trent and Northeast Cape Fear rivers, not to mention many smaller tributaries. The best white shad rivers are probably the Cape Fear and Tar rivers. One annual hotspot on the Tar is on the stretch behind Bob Melton's Bar-B-Que in Rocky Mount. Good catches are also made below each of the three locks on the Cape Fear below Fayetteville. There are free boat ramps on the Cape Fear below each lock, and you'll need a boat to get into the best fishing. There's also a North Carolina Wildlife Resources Commission free boat ramp on the Tar River behind Melton's.

Since these spots often get crowded during the peak of the run, you may want to do a little exploring. Believe me, there are lots of topnotch shad hotspots that are rarely, if ever, fished even during the peak of the run. One reason is because sport fishing for shad is relatively new. Fifteen years ago, very few fishermen in North Carolina even knew that shad would take artificial lures.

Most fishermen use standard spinning tackle with six to 10 pound test line. I personally prefer ultra-light spinning tackle with four-pound test monofilament, especially for hickories. Ultra-light will also handle the larger whites if you've got room to play them carefully. Hickories make short runs and do a lot of jumping like tiny tarpon. The larger whites don't jump as often, but they are capable of making longer, more powerful runs, especially against a lightly set drag and four-to six-pound line.

Your choice of lures will vary from place to place, and you may want to pick up some local favorites at a shop near where you plan to fish. Small lead-head jigs called shad darts are probably the favorite lures with red, white and yellow being the most popular color combinations. Try various sizes (not too large) and colors. Shad can be quite color selective at times. Spoons, especially the No. 1 Reflecto, are excellent choices both for hickories and whites. On the streams near Grifton, the Reflecto spoon may be the best producer for hickories.

Many anglers rig their lures in tandem using either two darts or a dart trailed by a spoon. It's a very effective technique. With ultra-light spinning and light line, you won't need to add any extra-weight, but with the heavier outfits, many fishermen hang their tandem rigs behind a small trolling lead or egg sinker.

The fishing technique calls for casting across the current and retrieving rather slowly (and usually steadily) while the darts or spoons sweep downstream near the bottom. Be sure to fish the lures all the way back. You'll get hung up occasionally, but that's all part of the game.

If you've been promising yourself to try shad fishing, don't put it off another year.

Put and Take Hunting

by Bob Gooch
Troy, Va.

PHOTO BY THE AUTHOR

A warm March breeze brushed my face as I moved in behind the seemingly frozen setter. My host raised his hand and nodded toward the classy pointer moving in to honor.

I waited.

Now all was set. I was dead center in the rear of those eager dogs, and there was plenty of shooting room. In fact several hundred acres of it. Following months of wading through briers, brush, thickets and underbrush for chance shots at wildly flushing bobwhites I found this almost unbelievable.

But don't get your hopes up. The kind of shooting I was about to experience rarely exists anymore, except on controlled shooting preserves. And that was the site of this dramatic moment.

Oh I had experienced this kind of shooting before, a good 30 years earlier in the golden era of family farms and patch farming. I cut my hunting teeth in those years and the fever has never cooled. Like most hunters, however, I always expect my next hunt to produce action reminiscent of the old days.

Edgy and trembling, I edged past the quivering noses of the equally tense dogs. It's a heart attack moment. The birds can erupt at any moment, and in spite of years of experience I am never quite ready for the explosive moment.

Suddenly the grass and weeds seemed to explode at my feet and the air was full of brown bombshells and madly beating wings. Somehow out of the confusion I isolated a lone target. My little 20 barked and the quail bit the dust.

The birds were getting rapidly out of range, but suddenly I spotted a late riser out beyond my wavering muzzle. It joined the first one on the ground.

But not for long.

Those pointing dogs were now retrievers, again displaying unique class, a characteristic not always present in otherwise top bird dogs.

Controlled shooting preserve hunting is much like put-and-take trout fishing, except that shooting preserves are privately owned and operated. Many hunters turn their back on such hunting—as trout purists shun stocked trout. But like put-and-take trout fishing, shooting preserve hunting is a coming thing in America. It's a kind of hunting that will win slow but eventual acceptance.

Sure, I prefer hunting for wild birds, just as I prefer fishing for wild trout, but I also enjoy put-and-take trouting. And like many hunters I occasionally turn to controlled shooting preserves. Several things prompt me.

But first what is a controlled shooting preserve?

The typical one is privately owned and operated for a profit—much like any other business. The operator could likely make more money, however, in some other business. He is probably a hunter himself, enjoys hunters, dogs and birds, and is willing to accept a smaller financial return for the privilege of working with them. In order to operate his preserve he must be properly licensed and meet strict requirements* including a minimum of 100 acres for his preserve. He must also assume the responsibility for his clients and their game at the end of the hunt.

Many preserve operators run their preserves as an adjunct to normal farming operations. They supplement regular farm crops with wildlife patches and many raise their own birds. Others purchase the birds full grown. They also keep several well-trained dogs for the use by clients who do not own dogs.

The average shooting preserve specializes in bobwhite quail hunting, but many also offer pheasants, chukars and mallards.

The hunter pays for the privilege of shooting on the preserve.

Many hunters frequent shooting preserves for the simple reason that such hunting is convenient and easily arranged. For the busy hunter with limited time, the shooting preserve eliminates the problem of scouting for good territory and getting permission to hunt it, keeping dogs all year, and traveling long distances to hunt. And best of all he is assured of game. He knows he will get all the shooting he wants or is willing to pay for.

My own visits to shooting preserves have been prompted by several reasons.

I enjoy pheasants—in the field and on the table. But the nearest reasonably good pheasant hunting is miles away, north of the Mason-Dixon line in Pennsylvania. Nonresident licenses are costly, and locating

*"Controlled Shooting Preserve Regulations" available upon request.

good hunting land in strange country is not often easy. I find it less costly, more convenient, and am more assured of game when I visit a local well operated shooting preserve. And if there is any difference between those gaudy cocks that spring cackling from a North Carolina cornfield and those that do likewise on the South Dakota plains, I have not been able to detect it. Even those South Dakota birds are not natives, though they do reproduce in the wild in the Dakotas and elsewhere in their adopted range.

It is not the nature of the ring-necked pheasant to become domesticated. Once released from its pen, the game preserve bird can be just as wild as the wild one.

The pheasant is not only a colorful and challenging bird to hunt, it is also a top choice for the table. A big cock will weigh three to four pounds, and a pair of birds will feed a sizable family.

Chukar partridge hunting is another exotic type of shooting offered on many preserves. Like pheasant hunting, good chukar hunting is miles away in the Far West—Idaho and Utah for example. The chukar is a beautiful bird, an import from India that weighs in the neighborhood of a pound and thrives on controlled shooting preserves.

I find it much more practical to pay a fee and hunt chukars locally than to travel 2,000 miles across the continent for the same game.

But for most bird hunters the bobwhite is the only gamebird worthy of consideration, and the major advantage the shooting preserve offers these dedicated men and women is a longer season. The controlled shooting preserves open in October and run well into March, stretching bird hunting to a full six months. That is half the year, additional months that are good for the dogs, and extra weeks of health building outdoor exercise for the hunter.

I have found shooting preserves ideal for working young dogs. The abundance of game and the extended seasons are real advantages. As any veteran bird hunter will tell you the very best training for a young dog is shooting birds over him—once he has learned the fundamentals. The shooting preserve makes this possible. The released birds hold better, giving the young dog a better opportunity to test his natural instincts and new found skills. And there is nothing that will bring a young dog along faster than having birds fall before his points.

But above all shooting preserve hunting is just plain fun, a more leisurely paced, relaxed kind of hunting. It is often close by, eliminating the need for those predawn trips through the night and long days that end at midnight.

Like everything else in America the costs of rearing and feeding gamebirds have soared in recent years, and shooting preserve operators have found it necessary to hike their fees. Even so the bite for three or four hunts a season is low when compared to the expense of raising, training and kenneling dogs, and long trips to distant points for wild birds.

Many preserves still charge a flat fee for the first eight or 10 birds and so much per bird for all above the "limit." Some operators have responded to increased operating costs with another approach, however. They charge the hunter so much to release an agreed upon number of birds and the hunter assumes the risk of not bagging all of them. This method is particularly true of chukars, birds that do not fly far when flushed. The hunter gets plenty of chances for second and third shots if he needs them.

Most preserve operators give the hunter the choice of working behind his own dogs or those owned by the operator.

And a feature that appeals to most hunters is the practice of preserve operators to clean and dress the hunter's game. He not only gets home early, but with a full bag—ready for the freezer.

NORTH CAROLINA LICENSED CONTROLLED SHOOTING PRESERVES 1975-76 Hunting Season

COUNTY	PRESERVE	GAME OFFERED
Ashe	Mulatto Mountain Shooting Preserve Warren G. Goodman, Sr. Route 1, Box 102 D Todd, North Carolina 28684 (Five miles southwest of West Jefferson) Telephone: 877-3255	Quail, pheasant
Bertie	Pine Valley Hunting Preserve C. M. McCoy and Brock D. Jones, Jr. 910 Medical Towers Norfolk, Virginia 23507 (Three miles from Lewiston) Telephone: 804-625-0557 or 804-489-7530	Quail
Cabarrus	R & R Hunting Preserve, Inc. J. V. Robinson Route 4, 3301 Dion Drive Matthews, North Carolina 28105 (Thirteen miles northeast of Charlotte) Telephone: 545-4167	Quail, pheasant, chukar
Cleveland	Paul D. Anthony Quail Shooting Preserve Paul D. Anthony Route 11, Box 357 Shelby, North Carolina 28150 (One mile west of Earl, North Carolina) Telephone: 487-7502	Quail
Cumberland	Brown's Shooting Preserve Charles C. Brown 512 Johnson Street Fayetteville, North Carolina 28303 (Twelve miles west of Fayetteville off Cliffdale Road) Telephone: 867-6358	Quail
Cumberland	Carver's Creek Shooting Preserve A. L. Maynor P. O. Box 5543 Fayetteville, North Carolina 28303 (Ten miles north of Fayetteville) Telephone: 488-4256	Quail
Cumberland	Recreation Shooting Preserve James A. Lattimore Recreational Services Division Fort Bragg, North Carolina 28307 (Ten miles west of Fayetteville) Telephone: 396-8789	Quail
Currituck	Currituck Shooting Preserve Robert J. Breiner RFD 2, Box 48-A Moyock, North Carolina 27958 (Three miles south of Moyock on Route 168) Telephone: 453-6846	Quail
Davidson	Crousedale's Farm Shooting Preserve Ray W. Crouse Route 11, Box 230 Lexington, North Carolina 27292 (Four miles north of Denton off Highway 109 one mile on Cedar Springs Road) Telephone: 869-3392	Quail, chukar, pheasant
Guilford	Rock Creek Shooting Preserve Johnie E. Fields 516 Banner Avenue Greensboro, North Carolina 27401 (Seven miles south of Gibsonville on I-85) Telephone: 274-7588	Quail
Halifax	Conoconnara Shooting Preserve Victor E. Smith Route 1, Box 138 Halifax, North Carolina 27839 (Three miles southwest of Tillery) Telephone: 445-5781	Quail

COUNTY	PRESERVE	GAME OFFERED
Hoke	Rorie's Sports Club Shooting Preserve John S. Rorie, Jr. 1665 S. Main Street Laurinburg, North Carolina 28352 (Six miles east of Aberdeen on Chicken Road at McCain property) Telephone: 276-5730	Quail
Iredell	Quail Hatchery Shooting Preserve No. 1 Paul Harmon Route 5, Box 163 Statesville, North Carolina 28677 (Fifteen miles north of Statesville) Telephone: 592-2935	Quail
Iredell	Quail Hatchery Shooting Preserve No. 2 Paul Harmon Route 5, Box 163 Statesville, North Carolina 28677 (Fifteen miles north of Statesville) Telephone: 592-2935	Quail
Iredell	Third Creek Shooting Preserve T. R. Ellis and R. M. Gardner Route 1 Stony Point, North Carolina 28678 (Ten miles from Statesville, go out I-40 to Old Mountain Road, take route to Gray Brothers Dairy, turn right on State Road 1537) Telephone: 585-6917	Quail, pheasant, chukar
Jones	D & H Hunting Preserve Harold Hargett, Jr. Box 264 Trenton, North Carolina 28585 (One-half mile west of Trenton) Telephone: 448-7431	Quail, pheasant, chukar, ducks
Moore	B & F Shooting Preserve Lonnie McKenzie Box 17 West End, North Carolina 27376 (3½ miles east of West End on Highway 73) Telephone: 295-3687	Quail
Moore	Pine Lake Shooting Preserve Jack Myrick Route 1 West End, North Carolina 27376 (Four miles east of West End) Telephone: 947-5302	Quail
Moore	Whispering Pines Shooting Preserve Colonel (Ret.) Karl Warmbrod Route 5, Box 35 Carthage, North Carolina 28327 (Five miles S.E. Carthage) Telephone: 949-2120	Quail, duck
Nash	Lower Forty Controlled Shooting Preserve W. H. (Bill) Jennings 210 Lillian Road Wilson, North Carolina 27893 (Two miles west of Balley) Telephone: 243-5472	Quail
Pitt	River Road Shooting Preserve Jimmy Hardy Box 707 Bethel, North Carolina 27812 (Approximately four miles west of Greenville on Old River Road) Telephone: 825-1081 or 825-3701	Quail
Randolph	Jackson's Creek Shooting Preserve Clay Yates Farmer Station Asheboro, North Carolina 27203 (Twelve miles south of Asheboro) Telephone: 857-2137	Quail, chukar
Randolph	Parks and Wright Shooting Preserve Hoyt Wright and Hazel Parks Wright Route 5 Asheboro, North Carolina 27203 (Nine miles south of Asheboro) Telephone: 381-3363	Quail
Randolph	Ramseur Quail Preserve Dr. C. A. Graham, Jr. P. O. Box 566 Ramseur, North Carolina 27316 (1½ miles north of Ramseur) Telephone: 824-8744	Quail
Randolph	Voncannon's Shooting Preserve Nolan K. Voncannon Route 1, Box 307 Asheboro, North Carolina 27203 (Four miles southeast of Asheboro off Highway No. 42) Telephone: 629-9253	Quail, pheasant, chukar
Robeson	Quail Meadows Shooting Preserve Walter E. Neal, Jr., M.D. 403 W. 27th Street Lumberton, North Carolina 28358 (Approximately one mile east of Lumberton on State Road 1948) Telephone: 739-2846	Quail
Rockingham	Butler Quail Farm Shooting Preserve Paul Butler Route 8, Box 228 Reidsville, North Carolina 27320 (Nine miles southwest of Reidsville) Telephone: 951-2607	Quail
Rutherford	Arrowood and Twitty Shooting Preserve Claude Arrowood & J. B. Twitty 801 Westwood Street Spindale, North Carolina 28160 (Three miles south of Rutherfordton) Telephone: 287-5820	Quail
Sampson	Point Setter Hunting Club Alton Willis Route 3, Box 35 Roseboro, North Carolina 28382 (Four miles south of Roseboro on SR 1255) Telephone: 531-3154 (South River)	Quail
Scotland	Carpenter Shooting Preserve Joe Carpenter Box 174 Wagram, North Carolina 28396 (Twelve miles south of Aberdeen, Highway 15-501) Telephone: 281-3280	Quail
Scotland	Quail Rise Shooting Preserve H. C. Newton Route 1, Box 232 Wagram, North Carolina 28396 (Nine miles north of Laurinburg on 501) Telephone: 276-3172	Quail
Stanly	Scott Shooting Preserve M. W. Scott Route 1 Stanfield, North Carolina 28163 (Nine miles north Oakboro) Telephone: 485-4375	Quail
Union	Circle C Farm Shooting Preserve Garren W. Clontz, Jr. Route 1, Box 426 Indian Trail, North Carolina 28079 (Northwest from Monroe, Hwy. 218 at Union/Mecklenburg county line) Telephone: 753-1352	Quail, pheasant, chukar
Union	Prospect Shooting Preserve, Inc. Bill Smith Route 1, Box 7 Indian Trail, North Carolina 28079 (From Trinity take 522 left on Highway 200, nine miles) Telephone: 882-1608	Quail
Union	Squash Hill Shooting Preserve M. N. Ballard 2018 Bay Street Charlotte, North Carolina 28205 (About ten miles east of Charlotte) Telephone: 376-6137	Quail, pheasant, chukar
Union	Waxhaw Hunting Preserve, Inc. Mrs. W. J. Lewis Apt. 2, 428 North Laurel Avenue Charlotte, North Carolina 28204 (Eighteen miles east of Charlotte) Telephone: 332-4675	Quail, pheasant
Wake	Arrowhead Shooting Preserve George Emory Route 2 Creedmoor, North Carolina 27522 (Five miles southwest of Creedmoor) Telephone: 528-1387	Quail, pheasant, chukar, duck
Wake	Tara Farm Shooting Preserve Macon Wilder 714 Newton Road Raleigh, North Carolina 27609 (Newton Road in north Raleigh) Telephone: 787-1192	Quail
Wayne	Maxwell & Edwards Shooting Preserve John L. Edwards 112 Springwood Drive Goldsboro, North Carolina 27530 (Ten miles southeast of Goldsboro) Telephone: 735-6672	Quail

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

N. C. Beach Buggy Association

The above group is holding its next meeting April 25 at the Ramada Inn, Nags Head. Interested folks should contact Robert Pinault, Box 71, Point Harbor, NC 27964.

National Wildlife Week This Month

We hope that your observance of National Wildlife Week, March 14-20, is well planned by now, but if you need last-minute materials as the supplies last, contact George Batts, RFD, Box 127, Fuquay-Varina, NC 27526. George is Wildlife Week State Chairman.

New Supply of Quail Cover Reprints

Another printing of the popular quail cover on the January 1975 WILDLIFE IN NORTH CAROLINA magazine is ready for sale. The reprints are 14 by 19 inches, signed by the artist, and are suitable for framing. Price is $3 each, postpaid.

Public Hearings on Hunting and Trapping Regulations for 1976-77

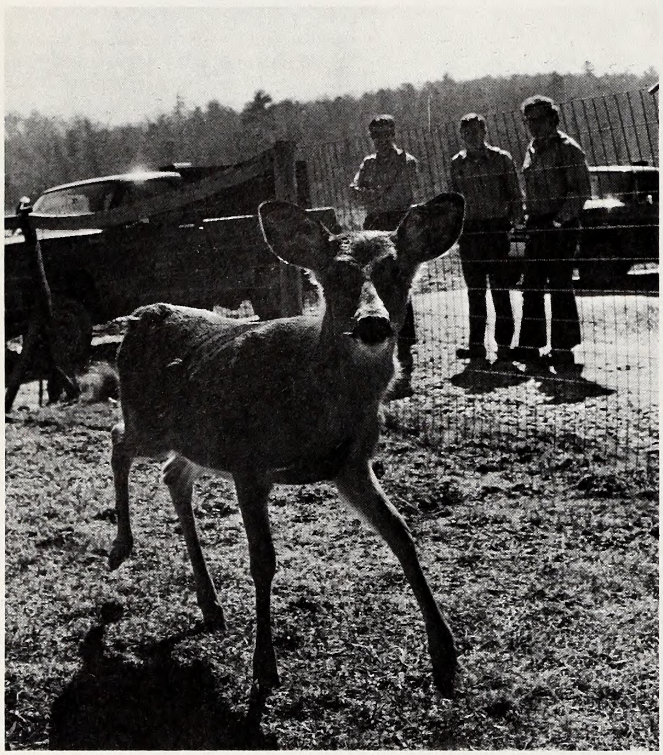
Date		Location
April 12	Edenton	Courthouse
April 13	Jacksonville	Courthouse
April 14	Louisburg	Courthouse
April 15	Elizabethtown	Courthouse
April 16	Graham	Courthouse
April 20	Sylva	Jackson County Community Service Center
April 21	Morganton	Western Piedmont Community College
April 22	Yadkinville	Courthouse
April 23	Albemarle	Central Elementary School

Still Time?

March 6 at 1:30 p.m., the N. C. Chapter of the Wild Turkey Federation kicks off a turkey calling contest followed by a banquet and art auction. Western Alamance High School five miles north of Burlington, NC, is the location. They need your support.

White-tailed Deer for Cowee

by Park Peterson, Darius Robertson
David Allen and Joffrey Brooks
Wildlife Management Technicians
Western Game Lands



A young white-tailed doe (upper left) destined for Cowee, prances in a retaining pen on the Biltmore Estate. The Biltmore herd is large, offering excellent opportunities for trapping deer. The Wildlife Commission and the sportsmen of North Carolina are indebted to the owners of the Biltmore Company for allowing deer to be moved from the well-established herd on the estate for relocation to restoration areas throughout the mountains.

Deer were captured by both rocket net and box trap. Cliff Bampton, now chief of the Division of Game, arranges apples (above) as David Allen, wildlife technician - Andrews Crew, checks rocket wiring.

The rockets, being positioned by David Allen (left) fit into five foot high launchers in order to project the net over the heads of the deer. Black powder is fired electrically from a blind some distance away.

Photos by Nancy Brower
Asheville Citizen

THE folks who live around Cowee Mountain, over between Franklin and Sylva, are tickled pink! They've been regularly sighting deer on the mountain and in their pastures, areas where, before this year, the sighting of a deer was a rare occasion indeed. But they've got them now and they intend to keep them.

The release of 45 white-tailed deer in the Cowee Mountain area of the Nantahala National Forest in early 1975 initiated the deer restoration program of the North Carolina Wildlife Resources Commission on the Western Game Lands. This project is part of a statewide program which began in response to public interest in establishing deer populations on suitable, unoccupied deer range to expand deer hunting opportunities in the state.

The Cowee Mountain section of the Nantahala National Forest and surrounding private lands was designated the first deer restoration area for the Western Game Lands. This restoration area, located at the junction of Macon, Swain, and Jackson counties, meets all the criteria for restoration areas as adopted by the Wildlife Resources Commission. It has an acceptable diversity of habitat.

The captured deer are removed from the net or box trap and given an injection of tranquilizing drug to calm them and prevent self injury on the way to predetermined release sites. Box traps (below) were located in high deer use areas on the estate and baited with apples. The rocket nets proved far more effective than the box traps.

Cliff Bampton checks a sprung box trap to see if a deer is inside or if it has been tripped by a raccoon, possum, or one of several smaller animals that might have been attracted to the bait.

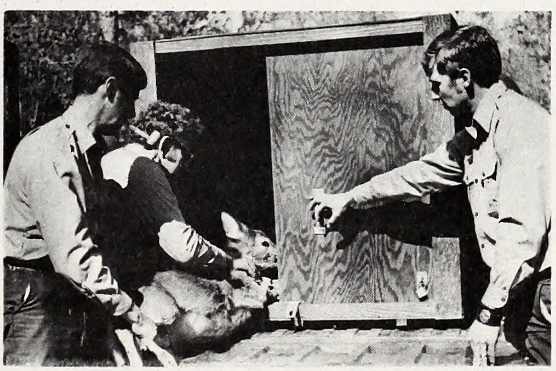
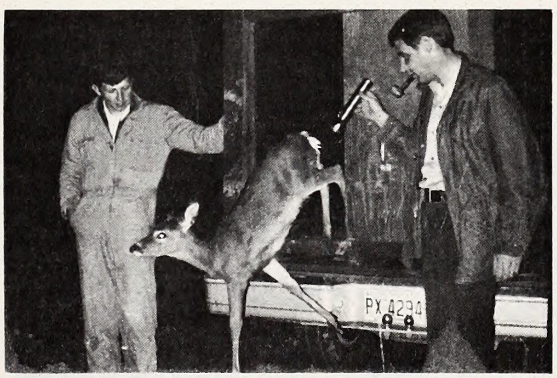


PHOTO BY WALTON R. SMITH

Each captured deer was immediately ear tagged with an identifying number and tranquilized before being loaded into transporting boxes. Once in the dark box, deer usually remain quiet until the doors are opened for release. Cliff Bampton, Joffrey Brooks and David Allen work together to avoid injury to the deer or themselves.



Many of the deer were trapped at night and were released on Cowee before the following dawn. Local sportsmen often joined the Commission personnel for the long trek on mountain roads to the release site.

good public support of the program was expressed at a public meeting concerning the project, there was no existing deer herd on the area and a sizable acreage of U. S. Forest Service Game Lands offered public hunting opportunities.

The continued success of this deer restoration project will depend on many factors, including the cooperation of local landowners and sportsmen in reporting illegal hunting and harassment of the deer by free roaming dogs. The guidelines for the restoration program specify that the area remain closed to deer hunting until the population becomes established.

The Cowee restoration project is only part of the total deer restoration program of the Wildlife Resources Commission. Similar trapping and restocking activities were taking place in the Northern and Central Game Lands during the same period as Cowee. Other areas throughout North Carolina, though primarily in the mountain and piedmont areas, are presently receiving consideration and evaluation for the restocking of deer. The program should eventually establish deer in suitable habitat throughout the state for the benefit of all wildlife enthusiasts. ⬍⬍

BLACK DUCKS

G. Michael Smith: A Portrait

Young Artist Uses Brush to Beat the Odds

by Jim Dean

PHOTO BY JIM DEAN

IT is interesting to contemplate the subtle and curious forces which mold a person's art. For some, the influences are direct and the results predictable. For others, like 29-year-old G. Michael Smith of Raleigh, N. C., these influences are casual, seemingly unconnected, accidental. One hesitates to use the word predestined, and yet . . .

Mike's early influences are fairly typical. His love of wildlife and hunting blossomed because his father, Joe E. Smith, took him hunting.

"I probably saw my first ducks on the kitchen floor, waiting to be picked," says Mike. "Dad began taking me hunting with him about the time I was six. We hunted doves, squirrels and later quail, and I also shared duck blinds with him down on the Pungo River in eastern North Carolina where we had a cottage. I didn't carry a gun then. I was the retriever."

Mike shot his first duck when he was 12—a mallard—in the marsh

Shown here are examples of Mike's fine color work which has been reproduced in high-quality prints. For information on these and others, write G. Michael Smith, 704 Kipling Road, Raleigh, N. C. 27610.

across the river from the cottage. Though he remembers it well, he had no way of knowing that this might someday help shape a career.

"Even later in high school, I never really considered art as a career, and certainly not anything as specific as wildlife or waterfowl art," recalls Mike. "I painted some posters and I was studying drafting. I remember drawing duck heads on my notebooks. I always thought I might be able to draw, but I only dabbled in it."

Then, when Mike was 19, he was in a water-skiing accident that broke his neck and left him handicapped and confined to a wheelchair. He was in the hospital for four months. Two weeks before Christmas, he came home. A neighbor gave him a set of charcoal pencils, never realizing how important that gift might be.

"There weren't many things I could do, of course," said Mike, "but I had a very strong urge to use my hands, to do something. I decided to try to draw something. I couldn't hold those pencils, but I found out that by sticking a pencil through a styrofoam block and guiding it with both hands, I could write and draw crudely, and naturally I used subjects I had great feelings for. Those first sketches of waterfowl were pretty rough, but people raved about them—probably to encourage me.

"I kept working at it for about a year, and although I was beginning to make some progress towards adjustment, I wasn't satisfied. Finally, after much consideration, I decided to go to a rehabilitation center in Warm Springs, Georgia. I spent seven of the greatest weeks of my life there. In addition to a psychological rehabilitation, I also got a new wheelchair and a set of hand splints that allowed me to write and draw normally again."

MIKE returned to Raleigh and re-entered N. C. State University where he studied sociology. While there, he learned about the printing business and also began to spend more and more time drawing.

"But I was spending more time drawing than studying, and I was also worried about being a burden to my parents at the age of 22," says Mike. "I was doing a lot of black and white ink drawings, concentrating mostly on ducks. I sold some of the prints, and tried my hand at a full color wood duck painting. When that first painting was used as a cover on WILDLIFE IN NORTH CAROLINA, I knew I'd found the answer. I could make a living."

In rapid succession came more prints and more full color paintings, and Mike soon had an avid local following. He also became active in the local Ducks Unlimited chapter and donations of prints to D.U. fund raising projects gave him a wider audience that has grown steadily nationwide.

"I've been concentrating almost totally on waterfowl subjects since then," says Mike. "The problem now is finding time to paint. I get so involved with the business aspects of this whole thing that I sometimes have a hard time sitting down and working. Also, I'm not the most disciplined person in the world when it comes to work habits. My wife, Jane, sometimes has to force me to go to the drawing board and order me to work. I have to be in the mood.

"I suppose it's the same with anyone who makes a business out of a hobby. If painting were only a hobby with me, I'd probably do it all the time. That's only human nature, I guess. When it becomes a business as well, that makes it tougher.

"I'm hoping to change that, however," says Mike. "If I can find someone to help me with the business aspects of my work, I'll be able to spend more time at the drawing board. At least, that will make it seem more like a hobby again.

"In the past few years, interest in waterfowl art has risen sharply, and this has helped," says Mike.

• **continued on page 26**

Stem to Stern

BY ED JENKINS

"Starter wire broke . . . sparks ignited gasoline fumes"; "Engine backfired and caught fire"; "I had just refueled and was leaving fuel dock when engine compartment exploded and caught fire."

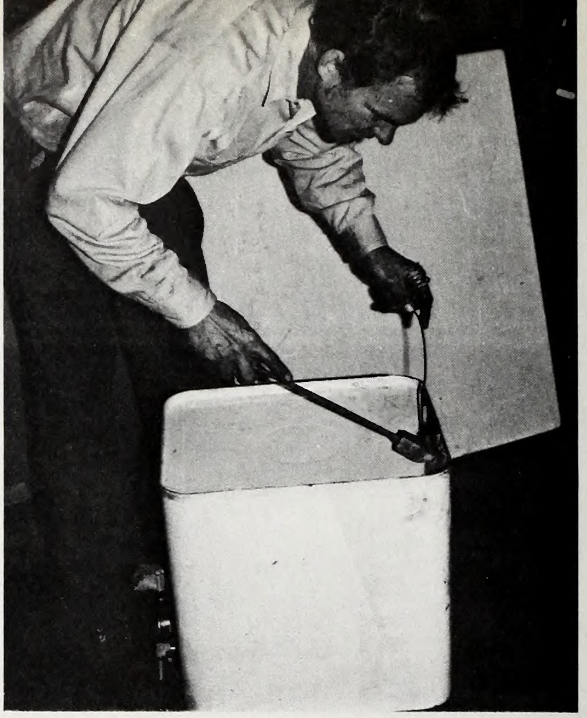
The statements above are taken from boating accident reports submitted by several unfortunate boat operators whose boats were destroyed by fires during 1975. Boating accident reports received by the Wildlife Resources Commission, Division of Motorboats and Water Safety, indicate boat fires are responsible for more loss of property than any other cause.

The greatest cause of fires and explosions aboard boats is gasoline vapors accumulating in compartments and low areas in the boat. The vapor is heavier than air and may settle into spaces in the boat where there is no escape except through the ventilation system. If fresh air is not ventilated into these spaces to flush out the fumes, the vapors collect just waiting for a cigarette ash or spark to ignite them. One cup of gasoline allowed to vaporize has the same explosive power as 15 sticks of dynamite. Even the slightest fuel leak or spill poses a dangerous threat.

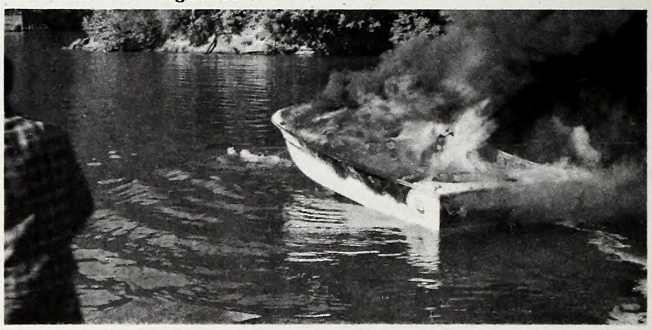
It takes oxygen, heat (ignition source) and fuel, all three to cause a fire or explosion. You cannot eliminate the oxygen (except in fire fighting with an extinguishing agent). Sources of ignition are numerous and while certain items such as backfire flame arrestors mounted on carburetors and spark proof switches on electrical equipment reduce the danger of sparks, batteries, wiring, distributors as well as cigarettes have a way of producing a spark that can ignite gasoline fumes. The best way of avoiding boat fires lies in the elimination of fuel (vapors).

The first and most important step in reducing the possibility of flammable vapors from collecting, is to observe all safety precautions in handling volatile fuels. Most fires and explosions on boats occur either during or immediately after fueling. For this reason there are several rules that should be followed when fueling a boat.

- Try to fuel the boat in good light. It is easy to spill gas when it is dark.
- Shut off all electrical equipment on the boat and no smoking during fueling.
- If you are in a cruiser, shut all doors and hatches through which gas fumes might creep into closed spaces.
- When filling metal tanks, be sure the gas nozzle is in contact with the tank at all times to prevent a static spark.
- If you have portable fuel tanks, fill them away from the boat.



Leaking fuel tanks (above) should be repaired immediately. Let an expert make the repairs and pressure test the tank afterwards. Apathy and panic were as much to blame for this (below) as were gasoline fumes. No one even tried to use a fire extinguisher.



- Don't fill the fuel tank to the brim. Leave some room in tanks for gasoline to expand. Put the fill cap on as tightly as possible. Immediately wipe up any spilled gasoline and discard the rag.
- Air the boat out well after fueling and give the boat the sniff test with your nose before starting the engine.

Another important step in preventing boat fires is in early detection of leaks in the fuel system. Industry and government standards are improving the safety of boats manufactured, but hoses can work loose or become worn and fuel tanks can develop leaks. Inspections should be made periodically to insure the fuel system is in good shape.

A good ventilation system is also required if boat fires are to be avoided. In an open boat the gasoline fumes may be dissipated through the scouring effect of the wind. However, boats with closed compartments require ventilation cowls (scoops) and ducting which flush the engine and fuel compartments with fresh air and remove dangerous vapors from the bilges.

The last line of defense against boat fires is the fire extinguisher. The extinguisher should be Coast Guard approved and be fully charged. It should be located in the boat where it can be grabbed quickly. Unless boat fires are immediately brought under control, there is little chance of saving the boat.

PHOTO BY GRACE DRAPER

Watchout for Bluebirds

by Grace S. Draper
Pleasant Garden

DID you know that the lovely little eastern bluebird, our traditional "symbol of happiness" for many years, is now considered by many conservationists and conservation organizations* to be on the endangered species list?

*Among these are the Wilderness Society, the National Parks & Conservation Association, the Smithsonian and the Maryland Ornithological Society.

This is disturbing news, which has been brought about by several factors: disastrous tolls taken on bluebirds by severe winters of such years as 1957-58; the fact that man is increasingly destroying the bluebirds' natural habitat including food and nesting sites as more farming and wooded areas are replaced by housing developments and shopping centers; the unrestrained and somewhat careless use of insecticides which either actually poison the birds or cause their eggs to be infertile; and that birds such as the English sparrow (house sparrow) and starling are continually preempting nesting sites, whether they be nest boxes or natural cavities in old trees and posts.

It's probably already too late to expect bluebirds to use boxes put up now, but make plans to get some up before March next year.

Many people have never even seen a bluebird, and many more never heard its cheery warble from the treetops or the telephone wires, upon which they like to perch. There is no thrill quite like the thrill of seeing a small flock of blue flashes cross your yard or garden. Just knowing that these birds like it near you and are building nests around you is a real source of delight.

In February, 1967, we reported via *Wildlife in N. C.* that our family had started a "Bluebird Trail" on our farm in Pleasant Garden, where we had often seen a few bluebirds. We started out with a mere seven boxes that year, gradually increasing the number to a total of 68 as of 1974. These boxes are located on our own farm and on the adjoining property of the Hagan-Stone Park, a city of Greensboro natural-area park. Records have been kept as to nestings in these boxes, and the 1974 figures follow:

No. of bluebird boxes available	68
Total number of bluebird nests	29
No. of nests of other desirable tenants**	13
Total number of bluebird eggs counted	164
Total number of bluebirds fledged	152
Grand total of bluebirds fledged since 1967	501

**Other birds which also like bluebird boxes are the Carolina wren, Carolina chickadee, tufted titmouse and brown-headed nuthatch.

When considering erecting boxes for bluebirds, it is important that such boxes be constructed according to proven preferred dimensions, based upon the birds' needs. Plans may be obtained from the N. C. Wildlife Resources Commission, 325 North Salisbury Street, Raleigh, N. C., free of charge, as well as from many other sources. Points to remember are that boxes should be approximately 5x5" inside, have a 1½ inch entrance hole (a guard strip across the hole will discourage starlings from trying to take over the box); with proper drainage holes in the bottom of the box and ventilation holes on the sides; and with a hinged top, preferably, for removal of the old nests. Old nests should be removed after each nesting as bluebirds like a clean, neat box, and the same box may be used several times in a single season—if not by the same birds, certainly by others who like the location. Occasionally an ant family will need to be removed, too. Be careful about spraying with insecticides! No residue should be left in the box as it could be harmful to baby birds.

What is a Bluebird Trail?

A "Bluebird Trail" consists of boxes mounted on posts (not on trees) in a specific area. Boxes should be erected as early as January or February, since the birds pick out boxes early and will be building nests by the latter part of March. Since bluebirds are quite possessive as to territory, boxes should be spaced approximately 400 feet apart. Five feet is a good mounting height, neither too high nor too low, and this is also a good height for access to the box in order to check on eggs and babies, and to remove old nests after the babies have been fledged.

The bluebird is essentially a rural bird which prefers nesting boxes located in open, sunny areas, such as

• **continued on page 26**

CRITTER

by Betsy Gatlin Wilson
Raleigh, N. C.
Photos by the Author

Young wildlife is usually best left in the woods where it belongs. But there may be times when you must help in some way. Be sure you obtain a permit to keep wildlife in captivity and follow the suggestions here.

CRITTER, as he was to be named, came into our lives a scared, shaky orphan one afternoon in late August, 1973. I spotted him in the grass on my way home from my teaching day at school. It was obvious he couldn't be left there, certain prey for any cat or dog that happened along, so I brought him home. Having had successful experiences with raising two other gray squirrels, "Lots A Luck" in 1971 and "Fellow" in 1972, George and I felt very confident that number three would be just as thrilling. Little did we realize that this tiny critter would create many exciting moments for us in the months and years to follow.

Using a medium sized cardboard box, we prepared temporary housing with all the comforts of a tree nest. This included cedar shavings, soft rags and even a heating pad at nighttime. With such "royal" treatment, it didn't take long for our latest squirrel to get accustomed to his new home and human friends.

He slept much of the time the first few weeks but would create a noise too loud to be ignored when feeding time was near. His little paws eagerly grabbed the "pet nurser" as he gobbled its contents, often pausing to catch his breath, then quickly back as if he would never eat again. Squirrels have individuality and are very playful creatures, so with a full stomach it was now play time. Many times after he curiously romped and played around the den floor and furniture, he would curl up in the most convenient soft spot he could find, such as a shirt pocket or sofa pillow. It wasn't long before Critter was off the milk and baby cereal diet and eating more "substantial" foods such as Hershey's Chocolate Kisses, M&M candies, cookies, crackers, fruit, and, of course, his more natural diet of nuts.

Squirrels are quite messy eaters and when Critter first began to gnaw solid foods, more ended up in the bottom of his box than in his stomach. As his manners gradually improved we allowed him to eat his meals on the back of the sofa or on the den floor. This freedom pleased Critter but resulted in a scramble as to who would get the goodies, Critter or Gredda, our dachshund.

As he grew and became much more "squirrely" he was obviously outgrowing his cardboard box and needed more moving room. During the fall and winter months, Critter occupied the specially built approved

Most wildlife reared in captivity won't adapt well to people and pets. But Critter did. That's Gredda (left).

When it's time to release "grown up" wildlife, this may be done gradually. Some won't "go wild."

Critter often returns "home" for handouts. This is one method of making the transition to the wild.

cage and wooden squirrel house as had the former bushytails. By the time warmer weather came around he was moved, cage and all, from the garage to an outside place beside the back door. From there he continued to enjoy his daily indoor visits, the activities which consisted of hiding nuts under furnture, cushions, and in corners, climbing window shutters and curtains, sitting on the window ledges, digging in the plants and drinking from the dog's water dish.

In March 1974 we acquired another young furry creature, increasing the pet squirrel population at our house to two. As Pack (named for the victorious N. C. State Wolfpack Basketball Team) grew, his cardboard box became a bit too small, so George and I decided by summer it was time for Critter's house to have a new occupant. Since in our past experiences we never saw our squirrel pets but a few hours or at best a few days after releasing them, we said good-bye to a now full grown, one year old squirrel, wondering if he could survive.

Our doubts were relieved several weeks later when Critter first visited us one bright Saturday morning. As he scampered across the patio, there was visible evidence of his fight for survival and he scurried toward us with a now healing notched right ear. This notched ear is a trademark and known throughout the neighborhood by wildlife watchers. We often hear of Critter's excursions to neighbors' houses to enjoy sunflower seeds, nuts and even watermelon.

Hand feeding of squirrels can result in bites or scratches. Often hands are mistaken for objects to be eaten. Critter sometimes jumps at fingers, chomping down but rarely breaking the skin. He loves to sniff around to find the goodies and then take his time eating them, maybe in a nearby tree or on a shoulder or even on an outstretched arm.

There is a tremendous amount of satisfaction and excitement in raising orphaned squirrels. Certain things we have learned might be helpful to the novice in raising a very young gray squirrel. It's usually best to use a milk formula such as Similac or Infamil fed from a miniature bottle. Sometimes extra holes have to be punched in the nipple to allow the right amount of nourishment. These pet feeders can be obtained from most any pet supply store. As the baby gains strength, the diet can be supplemented with a thin consistency of baby cereal and milk. This the squirrel can eat from the tip of a tilted spoon (which is a very messy undertaking, often resulting in a sponge bath for animal and human). When the young one starts to sit up on its wobbly back legs, begin leaving crackers, cookies, nuts, or anything for it to chew on in its box but keep up the bottle nourishment.

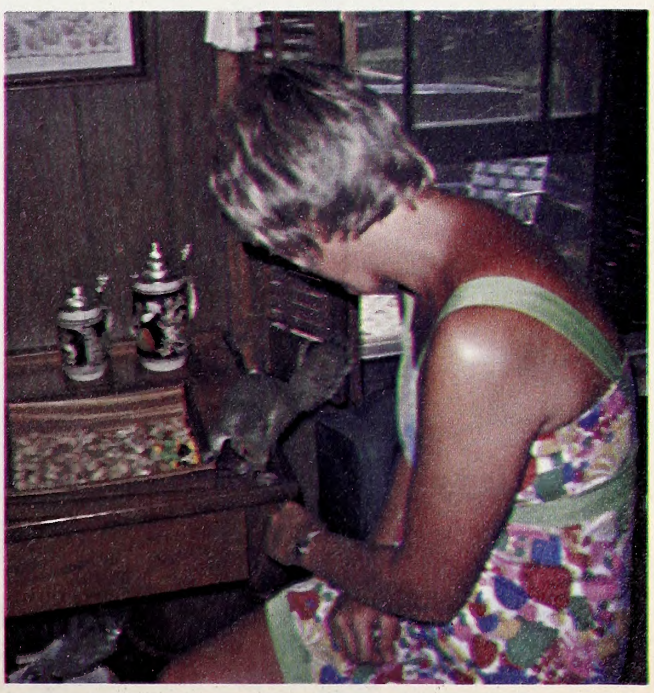
Our squirrels have weaned themselves. By this time, a young squirrel is ready to do some climbing, but can't be turned out into the wild. A cage (built to Wildlife Commission specifications) and a squirrel box for sleeping will allow enough room for daily exercises.

More than a year has passed since that summer day when we watched as he played in the trees and ate nuts from a clay flower pot. He still comes! If we don't see him first, he announces his arrival by crawling up and scratching on the back screen door. When the inside door opens, he makes himself at home, entering through a hole at the bottom of the screen and heads straight for the nut dish in the den. Depending on his mood, he may enjoy munching his findings right on the side of the wooden dish or on the back of the sofa. At other times he will carry the nut or other goodie outside to the patio bench or may even hop off to hide it in the yard. His pleasant woodsy aroma is a reminder of the wildlife he is.

Unless frightened, Critter always stays around until he has had his fill, then scampers off to his home in the woods behind us. Our respect for what he represents grows each time he comes and we eagerly anticipate his next visit.

You may be asking for trouble in giving your wild "pet" the run of the house. Critter is a bit messy, but he does have good taste in reading material!

Hand feeding wild pets can be tricky. Remember that wild things have sharp teeth and may bite. Even under the best of conditions, problems may arise.



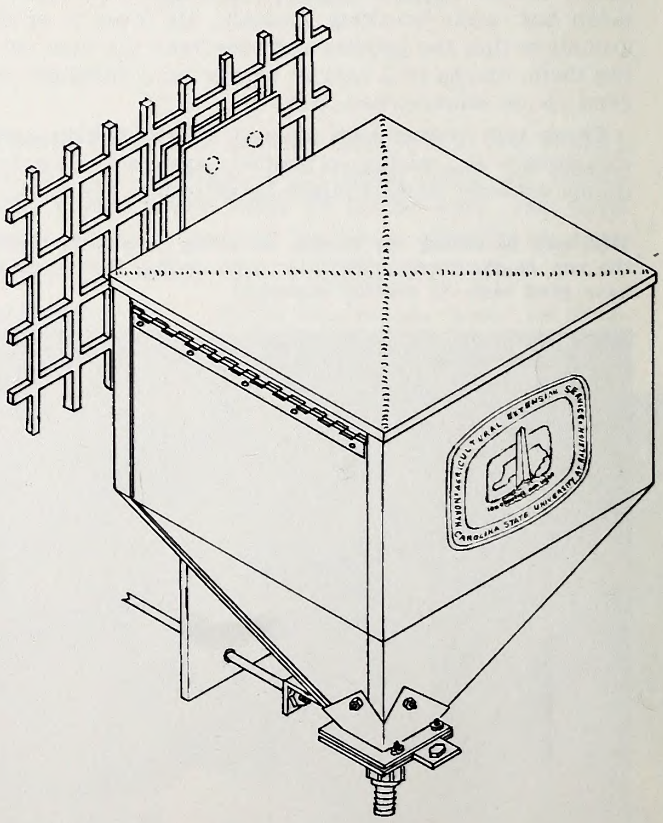
Shrub Lespedeza — a New Way to Plant It

by
Andrew J. Weber
Extension Asst. Professor
Forest Resource Mgt. Specialist
N. C. S. U.
and
Charles Woodhouse
Wildlife Biologist

There is little that could be done to improve this young stand (above) for wildlife. It meets many of the habitat requirements of a large number of species.

However, as stands mature and the canopy begins to close, plants that furnish food and cover for wildlife diminish. It is at this time that a stable source of food often becomes a limiting factor.

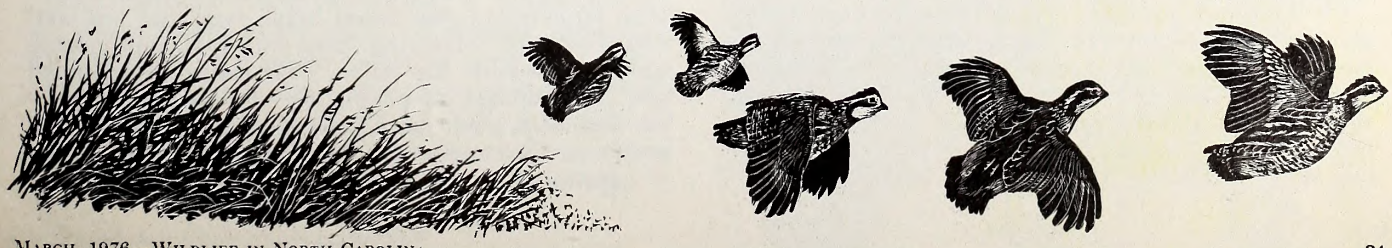
During the past several years, large and small landowners have begun to pay more attention to the management of their woodlands. In direct contrast to the old practice of cut-out and get-out, landowners are recognizing unproductive stands, harvesting them and regenerating new productive stands in their place. Establishing wildlife habitat plantings of shrub lespedeza in these new stands has been both difficult and expensive. This seeder should provide an economical, easy method for establishing wildlife habitat improvement plantings during either the site preparation or planting of seedling. Seed is available free from the N. C. Wildlife Resources Commission. Contact your County Extension office, local Soil Conservation Service office, Wildlife Enforcement Officer, or District Game Biologist. For more detailed plans for the seeder, contact: Seeder, Extension Forestry Department, Box 5488, N. C. State University, Raleigh, North Carolina 27607.



The plantation at left is two years old. The shrub lespedeza is already producing seed and by the time the canopy begins to close, it will be in full production. Seedling rates should not exceed every twentieth row. Seed is available free from the Wildlife Commission through your county extension agent, Soil Conservation Service representative, wildlife enforcement officer or district wildlife biologist.

The seeder (above) should be bolted to the cage as high as possible to allow the seed to flow down the plastic tube. The end of the plastic tube is mounted over the track. The seeds fall out on the track and are carried forward and buried in the freshly disturbed soil.

The best time to establish a wildlife habitat improvement planting is during site preparation or during the planting of a new stand. The seeder (left) is a simple hopper that tapers to a spout. A flange is attached to one side for bolting to the crawler tractor. A slide with a hole controls the flow of seeds. A rod attached to the slide extending into the cab allows the operator to control the flow of seeds. A 3/4 inch plastic hose (not shown), affixed to the spout allows the seed to trickle out on the track.



Court Decision Threatens North Carolina Wildlife

The area in the foreground is a small clear cut which has regenerated with various plants which will furnish food for deer and cover for small game. Without timber cutting, this situation cannot occur.

by Frank B. Barick, Chief
Interagency Wildlife Coordination

ON August 21, 1975, the U. S. 4th Circuit Court of Appeals in Richmond, Virginia, handed down a decision that can have a far-reaching impact upon wildlife and hunting in North Carolina. That decision, based on a law passed in 1897, resulted in the termination of all timber sales on national forests in the five-state region constituting the 4th Circuit (Virginia, Maryland, West Virginia and North and South Carolina).

The case before the court was a suit brought by the West Virginia Division of the Izaak Walton League, the Sierra Club, the Natural Resources Defense Council and the West Virginia Highland Conservancy. It charged that scheduled timber sales on the Monongahela National Forest were not limited to dead, mature, and large growth trees, nor were the trees for harvest individually marked, as prescribed by the law of 1897. Timber cutting prescriptions in the Organic Act of 1897 were appropriate at that time since much of the national forest was still composed of old growth virgin timber, also forest management practices designed to enhance timber production had not yet been developed, and there was a public outcry against the "cut, burn and get out" type of logging practiced by early timber barons. The art and science of forest management in this country were yet to be born.

Some of the earliest work in scientific forest management in this country was initiated in 1891 by Gifford Pinchot on the Biltmore Estate (now constituting a large part of the Pisgah National Forest). His early work was carried on after 1895 by Dr. Carl A. Schenck, a German forester. It was based on central European forest practices prevalent in some timber types that called for "selective cutting" of mature timber.

Since that time the research function of the U. S. Forest Service has been vastly expanded and practices designed to maximize timber production were developed that took into account not only the varied market for timber products but also the many different timber species and their ecological relationships. For many years forest management research was largely controlled by the selective cutting philosophy but over the years it gradually became apparent that some species could best be managed through cutting stands of trees (clear-cutting) rather than by cutting selected trees.

Furthermore, in many cases selective cutting degenerated into a series of "high grading" cuts that removed the best and fastest growing trees, leaving cull species and individuals to reproduce. In such cases, the resulting forest consisted of trees having low value for commercial products, and also having low value as wildlife habitat. It also became apparent that location of logging roads and improper methods of site preparation for replanting after logging could have a much more devastating effect on soil erosion and stream sedimentation than the degree of timber removal.

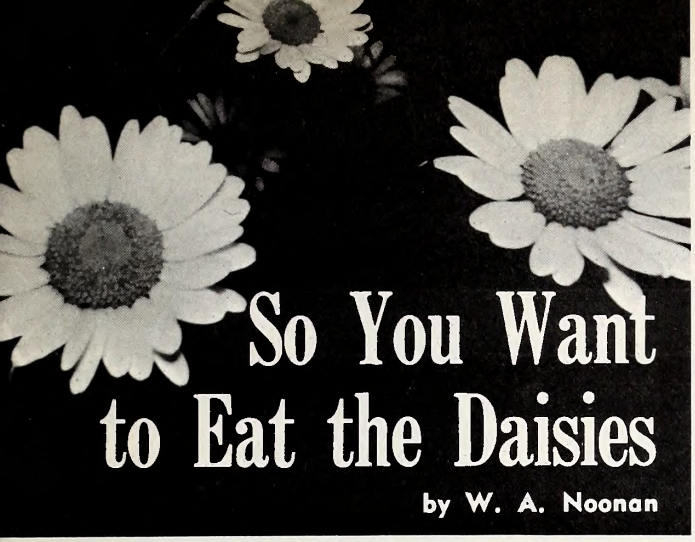
It is rather ironic that the Monongahela Case should be brought in 1975 since the forest industry, and the U. S. Forest Service in particular, have in recent years initiated remedies to the ills of clear-cutting and stream sedimentation. In response to concern expressed by wildlife managers as well as the new breed of environmentalists, clear-cutting units have been reduced in size, skidding and hauling routes modified to safeguard streams, and site preparation practices designed to reduce erosion. We obviously still have a long way to go to attain universal application of these conservation procedures, but we are well on the way.

The North Carolina Forest Service, in cooperation with the U. S. Forest Service, representatives of forest industry and environmental associations, is engaged in continuing development of environmentally sound forest practices that recognize wildlife interests. In cooperation with the North Carolina Forestry Council, they are developing plans to train loggers—the men who operate the chain saws and bulldozers—in how to remove the merchantable parts of trees without damaging the soil and waterways.

Also, over the past several years, the Wildlife Commission's biologists have played an increasingly active role in the prescription of timber sales on North Carolina National Forests. More and more they have helped guide location, size and nature of timber sales designed to improve habitat for wildlife on the entire 1.1 million acres that are now designated as Game Lands, under terms of a formalized cooperative agreement between the two agencies. Furthermore, the "featured species" concept initiated by the U. S. Forest Service a few years ago provides for intensified development for particular species such as deer, bear, boar, wild turkey, grouse, etc. in localities best suited to them and this has been very helpful in extending the range and abundance of these species.

"Clear-cutting" no longer portends doom to fish and wildlife. As it is increasingly practiced, particularly on U. S. Forest Service lands, cutting units are not more than 50 acres in size, often much less, and are well distributed. By scattering these high browse-producing units throughout the forest, deer range is expanded and opportunities for population "hot spots" are created. Similarly, such units provide ideal conditions for grouse in the mountains, quail in the rest of the state,

• **continued on page 26**



So You Want to Eat the Daisies

by W. A. Noonan

AND dandelions, and poke, and sumac? Well, you can; a lot of people are doing it as part of a growing interest, not realizing that many old-timers have eaten wild plants for generations, although more from necessity than for pleasure or curiosity. A word of caution, **be sure you know your plants before you start eating them.** Not all parts of a plant are edible, and some have to be cooked (boiled or fried) before they are edible; others are entirely poisonous.

Thanks to the Foxfire Books and to the late, great Euell Gibbons and his "Stalking the Wild Asparagus," "Stalking the Healthful Herbs," and others—Bradford Angier's "Field Guide to Edible Wild Plants," and Adrienne Crowhurst's now out-of-print "Weed Cookbook," to mention a few of my favorites, there are many resource and reference books to enable a rank amateur to become a connoisseur in a short time.

You don't have to be a botanist to identify most of the more commonly known edible wild plants. However, if you possibly can, it would be most helpful and rewarding to venture forth for the first time with someone knowledgeable about plants. This wild food interest is infectious, and if you are fortunate enough to find a truly infected devotee, you will also find a willing teacher.

Here are a few common plants and some of their uses:

- Young daisy leaves make a very tasty addition to a salad. This is the common ox-eye or field daisy **(Chrysanthemum leucanthemum).** The salad can be completely wild by using chickweed, wintercress, violet leaves, the very young leaves of dock and dandelion, Indian cucumber root, wild onion, and the petals of violet and dandelion flowers. Use a wine vinegar and oil, or your favorite dressing, and serve as you would a garden salad.
- The petals of dandelion **(Taraxacum officinale** —actually, each petal is a separate flower) added to a plain package muffin mix gives a unique flavor that you will want to try again. To prepare, separate the petals from the flower heads as soon after picking them as you can; if you wait too long you will find that the flowerhead has closed up real tight. Add ¼ cup of petals to the mix and stir thoroughly. Follow directions on the package for mixing and baking.
- Small, tender pokeweed **(Phytolacca americana)** shoots (8 inches or less) may be served instead of asparagus. To prepare, remove the skin and leaves, making sure not to use any part of the root. Simmer the whole shoot stems in a little salted water until they are tender, and serve with butter or a cheese sauce. Poke leaves can be boiled as greens, but use only the young, unfolding ones. Boil in a full kettle of water for 10 minutes; pour off this water, add fresh water and bacon drippings, simmer slowly for half an hour, and you will be serving the traditional "poke sallet."
- Staghorn Sumac **(Rhus typhina)** berries can be used for pink lemonade, jelly, pies, jello, ice cream, and candy. The time to pick them is when the heads have turned red, and the berries taste tart. To make "Indian Lemonade", gather the whole head, and when ready to prepare them run a fork through the head, removing the berries and discarding any undesirable ones. Crush the berries in a sauce pan, cover with boiling water, and allow to steep, away from heat, until water is well-colored. Strain through two thicknesses of cloth to remove the fine hairs. Sweeten to taste, cool, and serve.

Having tried the above recipes, if you want to try more and to learn more about wild plants and their uses as medicines and dyes as well as for food, you will have the opportunity the first weekend of April, 1976, at the Annual North Carolina Wild Foods Gathering to be held at Betsy-Jeff Penn 4-H Center near Reidsville in Rockingham County, April 2-4.

Participants will be housed in beautiful, rustically designed, heated Chalet type cottages, each accommodating 24 persons. Other facilities include classrooms equipped with sink, stove, and refrigerator, a spacious dining hall where real country cooking is served family style. The grounds have large fields, heavily wooded areas, many trails, and a pond.

The program will include slide presentations and informal lectures; field learning and gathering trips; food preparation of wild food dishes and snacks; and loads of good fellowship. There are promises of wild game—bear steaks, venison, duck, fish, etc., to provide a complete variety of wild food dishes.

Among the sponsors and supporters of this event

Gathering wild goodies at a previous outing are this year's guest lecturer, Edelene Wood (right), author Noonan (center) and an unidentified "student."

are the Rockingham Community College, Rockingham County Naturalist Club, North Caroiina Wild Foods Enthusiasts, Piedmont Appalachian Trail Hikers, Northwest Environmental Preservation Committee, Inc., Alamance County Wild Foods Club, and the Rockingham County Extension Service. Also expected are representatives of N. C. Dept. of Natural and Economic Resources Division of State Parks.

Guest lecturer and instructor will be Edelene Wood of Parkersburg, West Virginia, who will be making her fourth visit to North Carolina. Attesting to Miss Wood's magnetic attraction as a charming person and a talented instructor, is the fact that 15 North Carolinians journeyed over the mountains of Virginia and West Virginia last September for the Eighth Annual West Virginia Nature Wonder Weekend at North Bend State Park near Parkersburg, West Virginia.

All who made the trip also had the pleasure of meeting, hearing, and talking with the late Euell Gibbons and his wife Freda. Edeline has coordinated this event since she originated it eight years ago. Euell Gibbons commented to the writer that **she** had taught **him** a few things about wild foods during their years of association. Miss Wood's expertise will be a feature of the program.

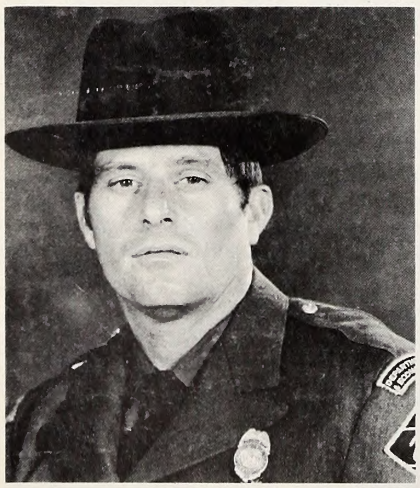
For further information and registration applications, write: Wild Foods, Rockingham Community College, Wentworth, N. C. 27325.

Registration will be limited, and reservations must be made by March 19 and will be honored on a first-come, first-served basis.

- Letters
- Comments
- This & That

BACK OF THE BOOK

William W. Ivey (left) of Asheboro was sworn in as Wildlife Commissioner of District 5 by Superior Court Judge Donald Smith in a regular meeting of the Wildlife Resources Commission on January 26, 1976. New officers were also elected at this meeting. Wallace E. Case (center, below) of Hendersonville was elected chairman; Roy A. Huneycutt (right) of Locust, vice chairman; and V. E. Wilson, III, of Rocky Mount, secretary.



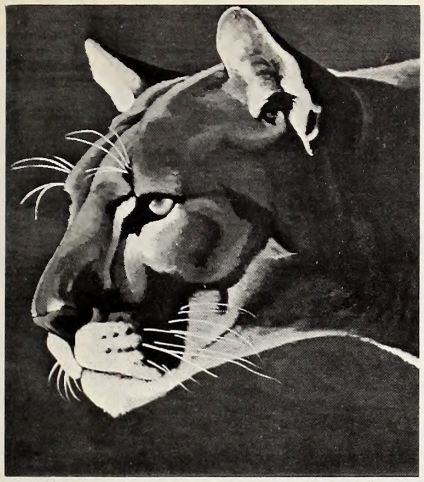
KNOW YOUR ENFORCEMENT OFFICER

Bruce D. Byrd

Wildlife Enforcement Officer II Bruce D. Byrd stationed at Greensboro, N. C., was born August 18, 1937, in Johnston County. He is the son of Mr. & Mrs. W. K. Byrd of Route 1, Angier, N. C. Bruce is a graduate of Cleveland High School. Prior to employment with the N. C. Wildlife Commission, he was self-employed and worked as an Inspector with the N. C. Department of Agriculture. Bruce completed the basic school for Wildlife Protectors in June, 1961. He was employed as a Wildlife Protector on December 1, 1961, and was stationed at Oxford. In March, 1962, he was transferred to Greensboro. In January, 1968, Bruce was promoted to Wildlife Patrolman and moved to Butner. In July, 1968, he was transferred back to Greensboro.

Since his employment with the Wildlife Commission, Bruce has completed all courses offered at the Institute of Government at Chapel Hill. In addition to these, Bruce received the Rural Outdoor Safety Award in 1965, Wildlife Protector of the Year in 1967, and a special award from the Sportsman Wildlife Club in 1968. Bruce is a member of the Guilford Wildlife Club, Sportsman Wildlife Club, Climax Hunt Club, Southeastern Association of Game and Fish Commission, and the N. C. Law Enforcement Officers Association.

Bruce is married to the former Judy Freeman of Benson, N. C., and they have two children, Dean, age 10, and Ann, age 8. The Byrds are members of the McConnell Road Baptist Church where Bruce serves on the Board of Deacons and is a Sunday School Teacher for the Junior Class.



Mountain Lions Revisited

Dear Sir:

I enjoyed, "Carolina Cougar: An Update," by Stewart Hardison, for I have known we still have the panther in Western North Carolina because I and my two sisters saw the big cat twice 15 years ago in our back yard. We said nothing about it because we were afraid our neighbors would not believe it.

We live in the Cullowhee Valley two miles from Western Carolina University, at this time a farming community. Our yard is huge, about one acre with an orchard and a mountain in the back.

My sister and I were teaching in the Jackson County Schools and had been to a teachers' meeting at night, another sister who lives just across the road had stayed with our father, who was ill, while we were at the meeting.

We drove into the yard and parked near the back porch under a maple tree, we got out of the car, slammed the door and a big animal jumped out of the tree over our heads on to a huge coal pile and the big chunks started tumbling down. I turned on a flashlight I had in my hand, and about that time our other sister turned on the porch light. There was the largest cat I have ever seen looking at us from the top of the coal pile. We said in unison—"It is a panther!" It was yellow with a long heavy tail. It gave one bound and was in the drive, then turned and looked back at us. It reached in length across the drive, then disappeared toward the wooded area. We called our brother-in-law from across the road and he went toward the wooded area and shown the flashlight but only saw two red eyes which faded away. He said we had no panther; it was a bobcat that we had seen. We three said no bobcat was that big or had a tail as long as its body. This happened in October.

A few weeks later at night our sister had been over here and started across the road to her home. She came hurrying back to the house and said there was a big animal tangled up in a chicken wire fence that was near the creek. He gave one leap and was up in the road and gone.

For several years we would see the big tracks, almost as large as my hand, near the creek in our yard where he had gone for water. When the snows came we would see where he had come down from the mountain and curious as a cat, sat and watched our lighted house. We had no dogs to distract him.

The next morning after our first sighting. The woman who stayed with us during the day said one of our neighbors was going home last night and saw a panther. We said nothing.

This summer we were discussing this sighting with a cousin who lives near, after we had read in the Asheville Citizen of two rangers seeing a mother panther and her cub in the Parkway and he said his father had told him that years ago our farm was in the path of a panther crossing.

I sincerely hope that the panther is back to stay. We have a mountain near called Panther Knob. It faces the back of our home.

Sincerely,
Sara Belle Moseman
Cullowhee

Dear Sir:

I have just finished reading the January issue of Wildlife. The article on "Mountain Lions" prompted me to write this letter.

The past summer I was fishing in Cranberry Creek which runs through Alleghany and Ashe Counties, North Carolina when I came face to face with a mountain lion. I started fishing where the road leaves the creek in Alleghany, winds over mountains to return in Ashe County. This stretch of creek covers about three or four miles.

I had covered about a mile when I heard growling in the bushes in front of me. My first thought was of wild dogs or a bob cat. I kept fishing until I was along side of the growling but could not see the animal. I became a bit nervous because I had never heard a growl exactly like this. I decided I would yell and try to scare it off. When I did, the most beautiful animal rushed to the edge of the water and started growling at me. It stood there, for what seemed like, three to five minutes. I stood very still and it eventually went back into the brush, still growling.

At this time the animal was behind me and I had to go down stream to meet my fishing partner who was to pick me up where the road comes back to the creek. I do not know if my fishing partner or anyone else believes me but I believe I have seen a mountain lion in the wild. There is no way I can be wrong since I was face to face with him, tail and all. He followed me down the creek for about a half mile, coming to the creek bank, growling at me, and retreating to the bushes.

Since this happened, I have come to the conclusion that it must have been a female lioness with young and she was protecting them.

I would like to hear from anyone who has fished this stretch of creek and perhaps seen or heard something that would prove my story.

Very truly yours,
Walter G. Johnson
Rockford

Dear Sir:

The article "Carolina Cougar: An Update" by Stewart Hardison, which appears in the January issue of "Wildlife in North Carolina" has very particular significance to me.

A few months ago a friend, Mr. Bob Sloan, editor of the Franklin Press, Franklin, N. C. and I were traveling a mountain road in the vicinity of Tapoco, N. C., when, upon rounding a curve, we saw a big mountain lion ambling across the road. We both have seen bobcats and knew immediately that this was not a bobcat, and from previous description felt sure it was a lion. Now, the pictures in Mr. Hardison's article confirm beyond doubt that it was truly a mountain lion.

Last week while on a trail about five airline miles from where we saw the lion I came upon the tracks of an animal I had never seen before. After seeing the picture of the lion's foot in Mr. Hardison's article, I am sure they were tracks of a lion, possibly the same one.

Very truly yours,
Mead Warren, Jr.
Vice President
Tapoco, Inc.
Alcoa, Tn.

• MICHAEL SMITH from page 15

"It's also made it harder in one sense because there are so many good waterfowl artists around. You just have to work harder to meet the competition."

Unquestionably, Mike's work speaks for itself on that point. Even though younger than many of his competitors, his paintings—shown on these pages—illustrate the extent to which he has overcome tough obstacles and achieved not only personal satisfaction and independence, but also artistic success.

"My dream," says Mike, "is to move down to the banks of the Pungo River and set up a home and studio with a big picture window overlooking the water. I want to be close to the ducks and the marshes."

The many people who hope to someday have one of Mike's paintings or prints would certainly reap the benefits of such an understandable goal.

"Snow Covered Marsh on the Pungo" available as a black and white print.

• BLUEBIRDS from page 17

the edges of fields or near hedgerows. There it finds its food, consisting chiefly of various kinds of insects and small berries. There, also, the birds can fly directly across the open space to their nesting box for feeding the young. This is a characteristic of the bluebird, and when choosing nesting boxes in early spring, we have often observed the birds fly across such open spaces, testing out the territory. Also, they like to have small trees or bushes nearby so that the baby birds can fly to such protective areas when they leave the nest box.

A pair of bluebirds may nest as many as three times in a season, beginning with the first family in April and going on into August. A clutch of eggs may vary from three to five eggs, in a pale blue color, as befits a bluebird. The nest will be carefully constructed of dried grasses and pine needles—often entirely of pine needles. It takes from 12 to 14 days for the eggs to hatch, and approximately 14 days for the babies to achieve fledgling size and to leave the nest.

There is generally a small loss of babies due to various reasons, including predators, but we have tried to avoid such possibilities on our "Bluebird Trail" by erecting predator guards around the posts on which our boxes are mounted. However, there are even human predators who insist on disturbing the nesting bluebirds—this is unbelievable, but true! Predator guards cannot eliminate this eventuality. We ask that all respect nesting birds, wherever they may be and whatever the species, and please refrain from disturbing!

Attracting Bluebirds

Bluebirds are insect and fruit or berry eaters. This means that they suffer for food in the winter, especially when the snow falls. Only rarely will they visit bird feeders, although they have been known to come to melted suet mixtures containing raisins or currants, nutmeats, and peanut butter. From observation, we have found berried plants that attract the bluebird in the fall and winter include the dogwood and pyracantha (or firethorn), as well as the weedy pokeberry and coralberry.

• COURT from page 22

and rabbits in all sections.

It is obvious, therefore, that the cessation of timber harvest on national forests in North Carolina is going to have a significantly adverse impact upon populations of these four highly favored game species. As recently cut-over areas grow out of the brush stage, they will contain less food and cover for these species and their populations will decline. There will probably be more squirrels, especially during high mast years, and possibly a few more turkeys. But this will be little consolation to the thousands of hunters whose prime pleasure is the stalking of deer and running their dogs in pursuit of grouse, quail and rabbits.

The opinion expressed by the Court that its decision would have serious and far-reaching consequence is prophetically true as it relates to wildlife and hunting. Unless the law is changed, hunting will suffer serious consequences in the years ahead. The Court also said that the 1897 Organic Act that forced its decision is possibly "an anachronism which no longer serves the public interest." With this, we heartily agree.

In rendering its ruling, the Court further stated "the appropriate forum to resolve this complex and controversial issue is not the Court's but the Congress'." Those who are concerned about developing a resolution of this issue that will favor wildlife management through forestry, and sustain recreational pursuit of wildlife through hunting, should convey their concern to their congressmen. The U. S. Forest Service is in the process of developing updating legislation that will provide for resumption of timber harvest in accordance with ecological principles. When these bills are announced, we should give them our full support and press for their enactment.

save our wetlands
National Wildlife Week
March 14-20 1976
JOIN AND SUPPORT THE NATIONAL WILDLIFE FEDERATION AND STATE AFFILIATES

Pink Lady's Slipper (White)

Pink Lady's Slipper

Wild Columbine

Photos by Ann Hawthorne

Trillium

Yellow Jessamine

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Wildlife

IN NORTH CAROLINA

APRIL 1976

PHOTO BY TED DOSSETT

"Wish I Could Fly"

And he soon will. The downy coat of the young great horned owl will be replaced by soft, strong feathers and he will become one of our most regal birds. Long may he fly.

STATE OF NORTH CAROLINA

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GOVERNOR

DEPARTMENT OF
NATURAL AND ECONOMIC RESOURCES
JAMES E. HARRINGTON, JR.
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Wildlife
IN NORTH CAROLINA ■

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An objective of all levels of government should be to achieve and sustain a balance of the social, ecological, and economic benefits derived from natural resources. Without such balance none of the factors on the scale will be worth weighing.

The yellow perch is certainly a handsome fish, but one that doesn't rate too high with most anglers. The nickname of "raccoon perch" probably comes from the distinct bars on the golden body which approximate the rings on the raccoon's tail. For a story on this interesting little fish, turn the page. Painting by Duane Raver.

THE YELLOW PERCH

By J. H. Cornell

ILLUSTRATION COURTESY MERCURY MOTORS

WHEN you mention yellow perch to a fisherman who has ever caught one, you can see him start to drool. Lots of game fish grow larger or are easier to catch. Some jump higher or fight longer on the line. But none is better straight from the frying pan in an overcoat of corn meal and butter.

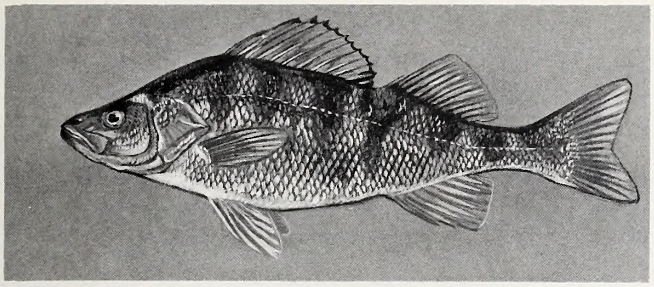
This little gamester is generally considered a northern fish. North Carolina seems to be near the extreme southern limit of its range. The center of abundance of the species is the Great Lakes Region, where yellow perch are of considerable commercial importance, in addition to their value to the sport fishermen.

The yellow perch, frequently known as the raccoon perch or ringed perch, is a beautiful fish, especially at spawning time, in the spring. Except where stunted populations exist, they characteristically reach a size of about 12 inches and a weight of about one pound. The sides and back are brassy-green to golden yellow, and there are usually seven broad dusky vertical bars on each side. The ventral and anal fins may be light grayish-green, but more frequently they are orange and shade to crimson at spawning season. The scientific name of this handsome fish is most appropriate. Its generic name, *Perca,* simply means "perch." The specific name, *flavescens,* literally means "yellowish."

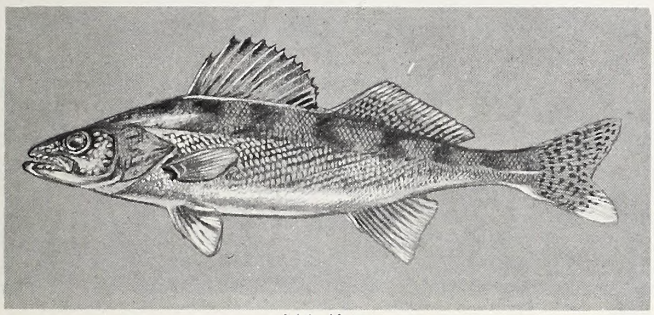
But color is never a dependable method of identifying a fish. Like the other members of the perch family, the dorsal fins are separate. There are 13 or 14 spines in the first dorsal fin. The second dorsal usually consists of 2 spines and 13 soft rays. The formula for its dorsal fin, then, would be written "XIII-II,13" or "XIV-II,13." The scale formula is "7,62,16." This means that usually there are 7 rows of scales between the dorsal fin and the lateral line, 62 scales in the lateral line, and 16 rows of scales between the lateral line and the anal fin. The anal fin has 2 spines and 7 or 8 soft rays. With this information the yellow perch usually can be identified, regardless of color.

Habitat

These fish seem to prefer lakes, large ponds, and large slow-flowing streams. They prefer water that is fairly deep, and their preference is for water which is too cold to please the largemouth bass and bream. One

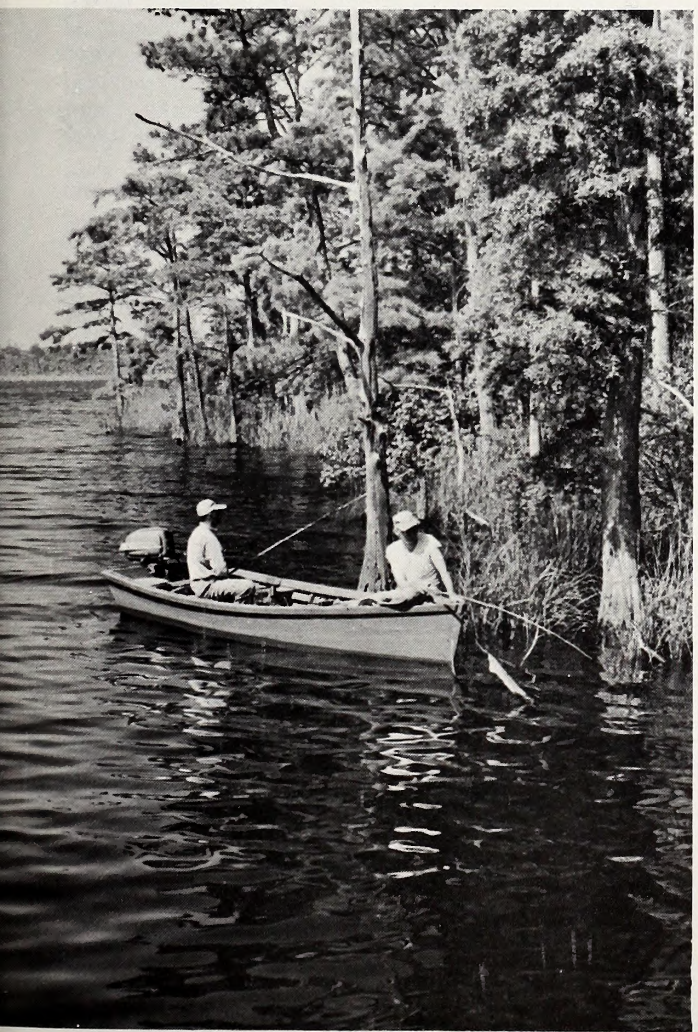


Yellow Perch



Walleye

The yellow perch and walleye are two of the large members of the true perch family which include the sauger and well over a hundred darters from two inches to five or six inches long. Yellow perch are widely distributed over the state and are found from the mountains to the brackish waters of the coastal sounds (below).



noteworthy fact concerning the yellow perch is that it seems to be able to exist under a greater range of conditions than most other fresh water game fish species. The larger perch remain in the deepest and coolest water they can find during most of the year, but are sometimes forced into shallow water during the summer to escape stagnant conditions.

Usually they are found in the vicinity of aquatic vegetation. They do not do well in waters which are turbid or are lacking in large weed beds. This probably is because a large part of their food consists of insect larvae, crayfish, and small fish which usually are concentrated in the beds of weeds or are living on them.

Life History

Yellow perch do not construct nests of any kind. Their eggs are laid in long gelatinous strings in shallow water. They usually are attached to the submerged parts of water plants or branches, logs, and stems or roots. Spawning takes place at a temperature of between 45 and 50 degrees, and one string of eggs may contain as many as 90,000 potential young. The egg strings are zig-zag in form like the sides of an accordian.

This egg string is unusual in that it is a hollow tube, and any vibration in the water, such as wave action, causes fresh water to move over the surface of the egg mass, both on the inside and outside. This water movement over the eggs supplies the necessary oxygen for them to develop without any effort on the part of the parent fish. It will be recalled that trout and many other species solve this problem by laying their eggs in running water. The bream and bass lay their eggs in nests and then fan them to keep them supplied with fresh oxygenated water. The yellow perch does it the easy way.

Perch are rather slow-growing fish, and in smaller ponds of water tend to become so numerous that they quickly exceed the food supply and become stunted. In this respect they are quite similar to bluegill sunfish in farm ponds. It usually takes three, and frequently four years, for yellow perch to reach a length of 10 inches.

Not the least of their disadvantages as a member of the game fish community is that they have a considerable interest in eating fish eggs as a part of their regular diet. Their predation on other species is much more serious in this respect than in the number of fish they eat later in life.

Importance

The greatest value of the yellow perch to fishermen lies in its willingness to bite at any time of the year and in its value as a table delicacy. They are seldom taken by the sport fisherman of the "purist" class. They seldom feed on the surface, but are taken on spinners and tiny plugs. Aside from the commercial nets which take large numbers in northern waters, they most often are caught by the man with the cane pole and small minnow or worm.

In North Carolina, near the southern limit of the range of the yellow perch, it is not nearly as abundant as it is in northern waters. However, it is of interest to fishermen in cold, clear lakes. The angler who uses small hooks with bait at depths of 25 to 40 feet may be rewarded in many of our waters by a catch of one of the most succulent morsels of fish life that ever graced a frying pan. ◆

PINE BEETLES— What's The Answer

by George E. Smith
Wildlife Forestry Supervisor
Division of Game

MIKE and I met at the Caswell Game Land equipment headquarters early in the morning and drove southeast towards Hightowers. Hightowers proper consists mainly of two country stores where you can always purchase a working man's lunch (pork 'n beans, crackers and your favorite beverage), stock up on the latest news and test theories concerning hunting, fishing and the general state of the economy. This particular morning, however, we resisted the urge to stop and turned north on N. C. Highway 119. After a short drive we approached a 2,000 acre tract of Wildlife Resources Commission owned lands near the Frogsboro community.

"Southern pine beetles are about to eat us out of house and home down there," Mike had already warned, so I was prepared for the worst. Mike Seamster is the Commission's wildlife forester in charge of forest management on the Caswell, Thurmond Chatham and Green River Game Lands.

After a couple of turns we left the main roads and began some careful driving over rough, sloppy trails that recent heavy rains had made impassable except to those with four-wheel drive vehicles. Mike eased the four-wheel drive shift on his pickup into position and we soon were approaching stands of trees where pine beetles were obviously active. Small patches of dead trees began to appear on my right, 10 to 20 trees at a time. The trail eventually led to the Game Land tract where Mike stopped the truck a few feet past the boundary line.

The evidences of pine beetles are often rather subtle and difficult to find until it is too late. The "galleries" (left) of the beetle are found under the bark, and the popcorn-appearing resinous material (lower left and below) is exuded as "pitch tubes."

PHOTOS BY DR. JAMES R. MCGRAW

"The infestation began in two or three spots on adjoining property and spread over an eight to ten acre area after crossing our line," explained Mike. "Let's take a walk to the next ridge. The center of the major kill is over there."

After a short walk into a narrow bottomland site and then up a steep hill, a large area of dead shortleaf and Virginia pines came into view. The browned needles still attached to the branches made for a very unusual contrast against the adjacent green tops of pines not yet infested. I felt a twinge of sadness in the realization that these trees had lived for over 60 years and that death had now come almost overnight.

"This is one of the largest kills so far on Commission owned lands—at least six to seven hundred trees," I said as we walked along.

"It's the largest on Caswell this year," Mike added. "But we have at least four more substantial infestations on this tract and at least 30 more over the entire Caswell ownership."

* * * * * *

My recent trip to inspect timber loss caused by the southern pine beetle on Commission lands is typical of what a good many landowners have been experiencing recently due to this small forest insect. This species of pine beetle has been around for a long time, but, for the past two years, sudden population buildups have caused substantial damage to forests throughout North Carolina and other southern states. Commission forests have not escaped the presence of this unwanted visitor. We have had to initiate salvage harvesting in several stands of pine involving several thousand trees, but we have also lost many times that number in small areas where too few trees were involved to be profitably harvested.

In some sections of the state, local sawmills and pulpwood dealers have had so many requests to cut tracts where infestations have been particularly widespread that selling damaged wood is impossible at times. Adverse economic conditions have resulted in less demand for most forest products; therefore, the sale of damaged trees at any price has been particularly difficult. For this reason, the recent pine beetle build-up had been untimely, to say the least.

Forest entomologist do not know for certain what has caused this sudden increase in the southern pine beetle population; however, foresters have found that old, overcrowded, slow growing shortleaf and loblolly pine stands on poor sites are prime targets. Initial infestations often start in trees damaged by construction or logging equipment or in trees damaged by lightning strikes. Management techniques which tend to encourage vigorous, healthy trees offer the best protection against severe infestations. Thinning at proper intervals during the life of the stand is one of the best ways to maintain good growth. Fertilization is now being used to an advantage in some areas.

What is being done to combat the southern pine beetle in woodlands? At the present time, no single approach is relied upon for control. Aerial and ground detection, harvesting infested trees, and as a last resort, limited chemical spraying are several of the different methods. Currently, the Southern Pine Beetle Action Council (a citizen's group) and the USDA Expanded Southern Pine Beetle Research and Application Program are coordinating a 5-year, southwide,

PHOTOS BY GEORGE SMITH

Once a stand is infested with the pine beetle, control measures are very difficult, and a loss of many trees can usually be expected.

Completely dead trees are eventually very obvious. Insect-eating birds, particularly woodpeckers, are often attracted to these areas.

multi-organizational research effort to develop management and control techniques that will be operationally feasible, ecologically sound, and environmentally acceptable. We will have to wait for a good answer to the question of control in the woodlands. Indirect controls such as the use of certain chemical attractants are still in the experimental stage. Success has mostly been confined to small infestations where early treatment by tree removals in combination with chemical sprayings have been applied.

We will have to wait for a good answer to the question of control. Information concerning the control of southern pine beetle in yard or shade trees can be obtained from the North Carolina Agricultural Extension Service or your local county agent. Spraying with chemicals such as lindane should always be carried out with extreme caution. Improper applications could be injurious to man, beneficial insects, fish and wildlife.

* * * * * *

"I want to show you something interesting on one spot near Country Line Creek. It's just off the main highway on the way back," Mike said as we returned to the pickup.

We rode for about 20 minutes in the direction of Yanceyville, the county seat of Caswell County. Mike turned off the highway about a mile from our starting point of earlier that day. As we approached the young stand of shortleaf pine, I recognized it as one that had been planted years ago when the property was owned by the U. S. Forest Service. The plantation was located on very poor soil, planted primarily to prevent soil erosion. At that time most of the Caswell Lands were being managed to assist recovery from adverse farming and timbering operations carried out during a period from about 1910 to the middle 1930's.

I was not surprised that pine beetles had decided to hit this stand of trees considering the poor soil, slow growth and general lack of response to earlier thinnings. We walked to a site where at least 25 trees were affected. The white popcorn-like pitch tubes protruding from the trunks of each told the story. Most of the trees were already dead and the rest would soon have brown tops.

"Look over there," Mike pointed to several trees that had been almost completely stripped of bark. "Looks as if a few woodpeckers are trying to give us some help." The birds had obviously been having a feast on beetles, larvae, and other insects which become more numerous as a tree begins to die.

"This is the most encouraging sight I have seen all day, Mike," I responded. My mind went back to the day almost five years ago when several pileated woodpeckers in the bottomlands nearby had stayed unusually close for several minutes as I marked timber that was to soon be sold. I had seen the large black and white birds in the area several times before. The size and beauty of this species of woodpecker is so impressive that no one can resist the urge to stop and watch when given an opportunity. Close observation is rather rare since the pileated usually takes flight at the first sight of man. In the timber marking plans for this sale, we had recognized the presence of this species and had been careful to leave feeding areas of old timber. I smiled as the thought crossed my mind—maybe those birds are now repaying the favor.

Whether or not the pileated fed at these particular trees is not the real point. The point is that some species of woodpecker did and that it was a simple event in the natural scheme of things. Birds attracted to higher than normal concentrations of insects have served to keep damaging species in check for thousands of years. One day soon we will have all but forgotten this epidemic of the southern pine beetle. The build-up will decline and we might even wonder what happened to reverse the trend. I doubt many will give any credit to the woodpecker as man continues to ignore the delicate balance on which he surely depends.

PHOTO BY KEN MOORE

THE NORTH CAROLINA BOTANICAL GARDENS

by Howard L. Ferguson

WILDFLOWERS can be found nearly everywhere in our state, but is it possible to find wildflowers typical of the North Carolina mountains, piedmont, and coastal plain all in one area? Yes, at the North Carolina Botanical Garden in Chapel Hill.

The North Carolina Botanical Garden is continuing to grow every year in both size and variety of educational and research programs offered to the public. Quite appropriately, this year when America is celebrating its 200th birthday, the Botanical Garden will be celebrating its 10th birthday with the dedication of its first permanent building, the Totten Garden Center. The Garden Center, made possible by a generous bequest from Dr. Henry Roland Totten and Addie Wiliams Totten is a large step forward in the long range plans of the Garden to continue its public service programs and activities dealing with the many fascinating, important and often colorful and attractive plants of the Southeast.

The North Carolina Botanical Garden is a 330-acre area of natural forests, open fields, and streams located on Laurel Hill Road off U.S. 15-501 bypass, one mile southeast of the University of North Carolina at Chapel Hill. Almost every major stage of succession is represented within the Garden's diverse land holdings. Habitats range from open fields to upland and lowland pine and deciduous woods of various age classes to steep deciduous wooded slopes and ravines, which include rhododendron and mountain laurel bluffs. Crisscrossing these various habitats are approximately five miles of a self-guiding trail system consisting of an upper trail and a lower bottomland trail.

This variety of plant communities plus an eight-acre pond at the Mason Farm tract provide an almost unlimited potential for the Garden's long range plan of extensive plantings of native trees, shrubs, wildflowers, and other interesting plants from many different environments.

Already, two small "habitat areas" have been developed. These areas represent a western North Carolina mountain habitat and an eastern North Carolina coastal plain habitat. Having these two adjunct plant communities represented in the Garden along with the typical piedmont plant species of the Chapel Hill area affords to the public and to the research community a unique opportunity to study the characteristic plants of each of the state's three physiographic regions.

Plantings in the "Mountain Habitat" section have been largely dictated by an effort to simulate the natural mountain communities. The visitor to this "flatland mountain habitat" first encounters a mountain laurel **(Kalmia)** bluff community which is situated opposite a cranberry bog. Even the canopy species give no hint to the actual piedmont locality —looking up one sees typical mountain tree species: white pine, eastern hemlock, and red spruce. Species within the cranberry bog include sphagnum, cranberry **(Vaccinium macrocarpum),** bogbean **(Menyanthes trifoliata),** cotton grass **(Eriophorum virginicum),** and white beak rush **(Rhynchospora alba),** which are all typical northern plants found naturally this far south only in a few locales in the western N.C. mountains. In another area the visitor can see a collection of almost every species of North Carolinas' mountain ferns.

And then taking a few steps "across the state," a visitor reaches the "Coastal Plains Habitat." This area centers on eastern coastal plain savannahs, open bogs and evergreen shrub bogs. Commercial and agricultural developments in our coastal plain are continually reducing the number of natural savannahs and bogs. Therefore, in order to educate the public and allow research in these areas, the Garden has simulated these coastal plain habitats as nearly as possible.

In this section the visitor walks beneath longleaf pines **(Pinus palustris)** and is surrounded by several species of fringed orchid **(Habenaria)** and by several different types of insectivorous plants including the Pitcher plant **(Sarracenia purpurea),** the Hooded Pitcher plant **(Sarracenia minor)** the sundews **(Drosera),** the butterworts **(Pinguicula)** and the popular Venus fly-trap **(Dionaea muscipula).** It is interesting to note that Addie Williams Totten was a leader in the successful appeals to the N.C. General Assembly which passed a law banning the sale of the Venus fly-trap.

These insectivorous plants and other typical savan-

PHOTO BY HOWARD FERGUSON

PHOTO BY CHARLOTTE JONES

PHOTO BY HUGH MORTON

Five miles of inviting trails (upper left) with native plants (and birds!) await the garden visitor. Mountain plants were saved by the Garden's "Plant Rescue Team" shown here in action at a proposed golf course site on Grandfather Mountain. Controlled burning (left) is necessary for the continued growth of many coastal plain insectivorous plants like the hooded pitcher plant on opposite page.

nah species such as yellow-eyed grass **(Xyris** spp.), pipeworts **(Eriocaulon** spp.), meadow beauty **(Rhexia** spp.), Blazing Star **(Liatris spicata),** and the Savannah sunflower **(Helianthus angustifolius)** are all early successional stage species. They require fire during the dry periods to protect them from being shaded out by the invading evergreen and semi-evergreen coastal shrubs. This shrub group, also present in the Garden, includes wax myrtle **(Myrica cerifera),** Gallberry holly **(Ilex glabra),** red bay **(Persea borbonia),** and sweet bay **(Magnolia virginiana).** The Botanical Garden simulates the natural fires by controlled burning of the coastal plain garden during dry periods in the winter. This section is therefore of particular interest to local teachers wanting to demonstrate the ecological principles of succession.

It is a very somber fact that the primary sources for most of the Botanical Garden's native plants are the many developments and construction sites across our state. The activities of the Garden's "Plant Rescue Team," composed of student workers and volunteers, has varied from the removal of a "honeysuckle jungle" attempting to strangle a lone deciduous holly tree **(Ilex decidua)** to the relocation of almost an entire community of bog plants from a coastal plain area slated for drainage and subsequent residential development. One summer the Garden staff, volunteers, and local homeowners participated in a large scale rescue at a proposed golf course site at Grandfather Mountain. The result was that thousands of mountain wildflowers and shrubs that would have been lost to the bulldozer are now relocated not only in the Garden at Chapel Hil but in various native plant collections across the state.

Another highly significant activity of the Garden is the interpretive walks and shows given to the public throughout the year. These have been made possible through the concerted effort of a core of dedicated and highly qualified tour guide volunteers. The interpretive walks are given for visitors of all ages—from preschool children and up. Upcoming walks of this year include a "Trailing Arbutus Walk," a "Spring Wildflower Walk," and a "Mountain Wildflower Weekend Hike."

Closely integrated with these activities are the extremely valuable special interest extension courses and workshops offered to the public throughout the year. The Garden has attempted to develop a conservation program which teaches all facets of conservation and ecology dealing with native plants and habitats. Past courses have included terrarium workshops, succulent workshops, and winter botany courses. Some upcoming events and courses are: "Birds of the Carolinas," a "Spring Wildflower Course" in both Raleigh and Chapel Hill, a "Smoky Mountain Spring Wildflower Course," and a "Mountain Ecology and Nature Study Leadership Training Program."

It is quite apparent that the recreational, educational and research activities offered to the public are as diverse as is the garden itself. The increasing recreational value and concern for native plants presently occurring combined with the ever-shrinking acreage of wildlands will make the conservation, teaching, and research programs of the Garden increasingly important at both state and local level.

If you are interested in visiting or in volunteering your time and strength to the Garden, a good time to drop by would be during the dedication week of the new Totten Garden Center. The actual dedication of the Center is scheduled for April 11, at 2:30 p.m., and many exciting special events and workshops are being offered on the days before and after the dedication. Those interested should call 919/967-2246 or write (NCBG, Laurel Hill Road, Chapel Hill, N. C. 27514) for a newsletter. But hurry, many of these special events require pre-registration. Please include money for postage and handling.

Do come and visit.

Waterfowl Get A Helping Hand

by Steve Price
Houston, Texas
Photos by the Author

IT was a cold, dreary day in January, 1937, when a group of concerned conservationists gathered in Washington, D. C. to discuss and literally chart the future for generations of American hunters. Fortunately for us today, their decisions were the right ones, for now three and a half decades later, this organization has grown to over 90,000 members in three nations, whose contributions have totaled over $30 million toward their cause.

That cause is the preservation of waterfowl, and the organization is Ducks Unlimited, one of the most successful conservation movements ever started in this country. Each fall when you see wavering V's of geese overhead, or call a flock of green-headed mallards down to your decoy spread, it is but one more reminder of what American sportsmen have done for conservation when the chips were down.

During those Depression years, the chips were really down. In the previous decade, waterfowl hunters had seen the long, sky-blanketing flocks of ducks and geese dwindle alarmingly. What had once seemed a traditional heritage, a never-ending natural resource, was actually on the verge of being extinguished forever.

The foundation for Ducks Unlimited was actually started in 1929 when sportsmen formed a group known as the "More Game Birds in America Foundation." Their goal was to find the answer to the question of disappearing waterfowl populations, and their research occupied several long years.

They found that some 65 percent of North America's waterfowl are hatched in the rich marshlands and prairies of Manitoba, Saskatchewan and Alberta and that these Canadian breeding grounds were rapidly being destroyed not only by encroaching civilization but also by uncontrolled floods and natural droughts. They concluded that if waterfowl populations were to be restored and maintained, these prime nesting areas had to be rebuilt and preserved.

Ducks Unlimited was formed to tackle this titanic task. Today it continues to be a non-profit organization whose goal is simply stated as "the preservation and improvement of waterfowl breeding habitat."

Because U.S. funds could not be spent for Canadian conservation projects, Ducks Unlimited (Canada) was formed to actually handle the construction projects.

The first project started in 1938 in Manitoba's Big Grass Marsh, and not only American and Canadian conservationists pitched in to help, but so did the Canadian governments, local ranchers, communities and even various industries.

Since then, DU has planned, built and developed over 1,200 different "duck factories" throughout the Canadian provinces, from New Brunswick to British Columbia.

Some 2,000,000 acres of wetland are leased by DU, with over 9,500 miles of vital lake shorelines. Hundreds of miles of fences have been raised to protect the nest-

ing areas. Dams, dikes and levies have been constructed to control flooding, or to provide water in times of drought. Special aquatic foods have been planted to supplement the waterfowl diet. And nearly 200,000 birds have been banded as part of DU's continuing research into waterfowl migrations.

During 1973 alone, (the last year complete data is available at the time of this writing) Canadian construction embraced 43,000 new acres of marshland habitat and 500 miles of duck-producing shoreline. Of the 89 various construction projects underway during the year, 53 were completed and eight more were operational even though unfinished. It's a record every American can be proud of, whether he hunts his waterfowl with smoothbore, camera or binoculars.

All this has been made possible by concerned sportsmen, the very men many so-called "nature" organizations condemn for shooting ducks and geese. Yet, nearly 80 cents out of every dollar these hunters contribute has gone directly to Canada for the preservation and restoration of waterfowl breeding grounds.

Ducks Unlimited has successfully been able to show that habitat—not hunting pressure—regulates game bird populations. The abolishment of hunting, as some of these groups lobby for, would take away the dollars from Ducks Unlimited, as well as the $11 million gained annually from the sale of "duck stamps," and with that, the acquisition of those vital Canadian breeding grounds.

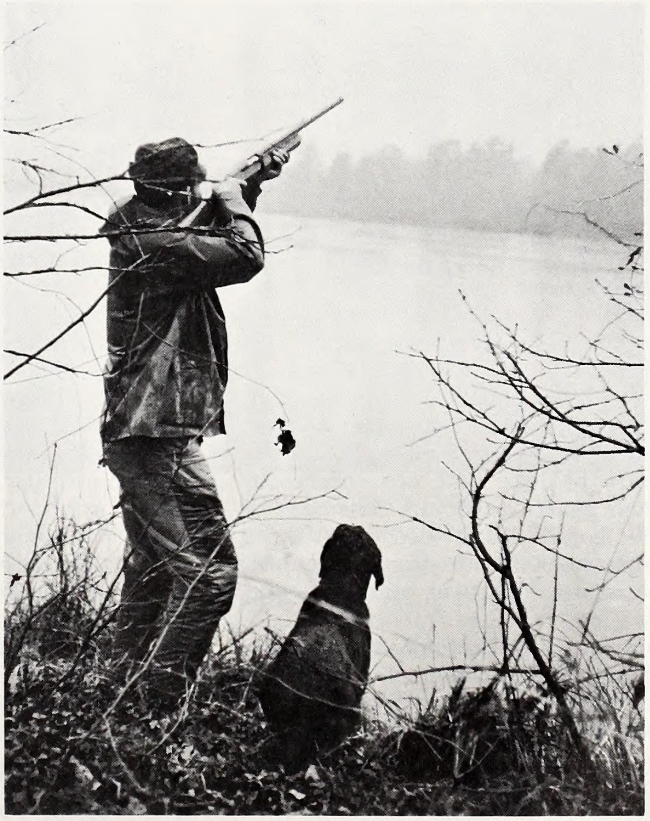
Duck hunters came perilously close to losing all they have worked for these 30-odd years, when four organizations in late 1974 filed in a New Jersey federal court for temporary injunctions against duck hunting anywhere in the United States. The four organizations were the Fund for Animals, Wildlife Preserves, Inc., The Humane Society of America and DEER, Inc.

Fortunately, Assistant U.S. Secretary of the Interior Nathaniel Reed argued successfully that prohibition of duck hunting would actually be disastrous for waterfowl populations because of the loss of revenue it would mean. The judge sided with Reed, ruling that *production* of ducks was the most important factor in their management, especially since hunters harvest only about one-fifth of the wild ducks that die in their first year.

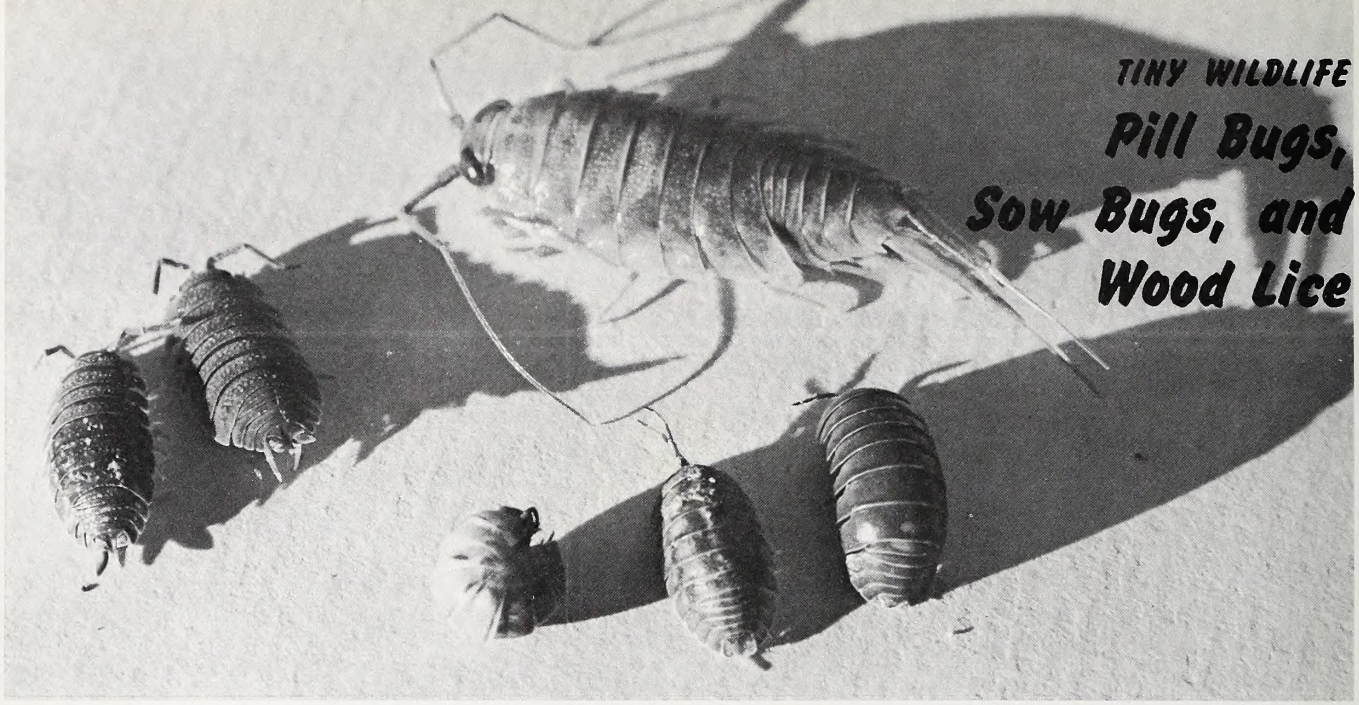
Funding for Ducks Unlimited comes from more than just the annual membership fee. Each fall, on the eve of the waterfowl hunting season, DU chapters across the nation hold fund-raising dinners and auction off various paintings, carvings, bronzes, even shotguns—all monies going straight into the Canadian wetlands. As an example of how serious American sportsmen are, one DU chapter in 1974 sold 1,200 dinner tickets at $30 each, and auctioned enough artwork to raise over $80,000 in one evening. For the entire year of 1973, DU sent $3,000,000 to Canada.

Even with these huge contributions, the future is not secure for North America's waterfowl. According to DU biologists, 4,500,000 more acres of habitat are needed to stabilize the population, and this land needs to be secured quickly.

Will America's hunters and sportsmen rise to the occasion, just as they did in those dark days of 1973? Judging from the record, the answer is an overwhelming "yes." ▲▼



Bird watchers also benefit from the results of the fine projects undertaken by Ducks Unlimited. These folks (above) watch a small flock of geese at Pea Island National Wildlife Refuge on the North Carolina outer banks. Charles Gibson (right) of Laurinburg is one of thousands of waterfowl hunters who support their own sport through contributions to Ducks Unlimited.



TINY WILDLIFE

Pill Bugs, Sow Bugs, and Wood Lice

By Rowland M. Shelley
Curator of Invertebrates
North Carolina State Museum

Left, two sow bugs, *Porcellio sp;* top, *Ligia exotica;* lower three, pill bugs, *Armadillidium sp.*

PROBABLY the most conspicuous invertebrates that live in association with man are the terrestrial isopods, commonly called pill bugs, sow bugs, wood lice, and slaters. They come in a variety of shapes and colors, and those of the genus *Armadillidium* (two species in North Carolina) can roll-up into complete balls when disturbed. In size they range from 3-4 mm, for *Trichoniscus pusillus,* to slightly over one inch, for the amphibious *Ligia exotica,* found scurrying over piers and rocks along the coast. Over a dozen species occur in North Carolina including *Miktoniscus alabamensis,* a cave form which has been found in Linville Caverns.

Literally translated, the term "isopod" means "equal foot or leg," and it refers to animals with seven pairs of legs that are similar in their general structure. The body of an isopod is divided into three parts: the head, bearing mouth parts, two pairs of antennae, and two eye patches (absent in subterranean species); the thorax, consisting of seven segments each giving rise to a pair of legs; and the abdomen, comprised of six segments containing the respiratory and, in males, the copulatory organs.

Isopods are not insects, as some people think, but belong instead to a group of animals called Crustacea, which also include shrimp, crabs, lobsters, crayfish, and barnacles. The Crustacea, in turn, belong to a group of invertebrates called arthropods, which also contain insects, spiders, ticks, millipeds, and centipedes. In addition to the forms on land, isopods also inhabit fresh-water and marine environments. Some marine isopods are parasitic on fish, shrimp, crabs, and other isopods, but all the fresh-water and land species are free-living.

Terrestrial isopods are interesting to zoologists because they are the only large group of Crustacea living on land. Most Crustacea are aquatic or marine with only a few terrestrial representatives, one being the ghost crab found on sandy beaches. The insects, spiders, and other arthropods are primarily terrestrial, with comparatively few species living in water. The land isopods of today are thought to be survivors of a much larger group that has passed its period of dominance and is declining, just as the alligators and crocodiles are remnants of a larger group of prehistoric reptiles.

Two basic forms of isopods occur in the gardens of North Carolina—the pill bugs that roll-up into balls, and those that remain flat, mostly of the genus *Porcellio*. These species were all introduced from Europe and are rarely found in natural environments remote from human habitation. Conversely, most of the indigenous North American species occur in areas away from man and are rarely encountered in urban habitats. This pattern is typical for many invertebrates since most introduced species cannot compete successfully with native species in natural environments. The cities and urban environments, however, are unoccupied and available for immigrants from other parts of the world. By far the greater proportion of the terrestrial isopod population of North America is comprised of introduced species, which flourish in environments created by man.

Whether native or introduced, the land isopods live in damp habitats in leaves and under rocks and logs, to avoid dessication. The ability to roll-up into a ball, while primarily a defensive measure, also helps retard the evaporation of water. Furthermore, the animals tend to aggregate and bunch together, thus protecting each other from water loss. They are photonegative and tend to avoid light, but this response is reversed if their habitat should become too dry, in which case they wander into the open to find another damp dark spot. Different species vary in their ability to withstand dryness, and the desert wood louse, *Hemilepistus reaumuri,* is relatively common in north Afri-

ca and the Middle East.

Wood lice are omnivorous and feed on algae, moss, bark, and decaying plant or animal matter. Digestion of cellulose is accomplished by symbiotic bacteria in the gut. In captivity, some isopods have been observed eating spider eggs, and one species, commensal in ant nests, actually feeds on the feces of its host. Some species may even become cannibalistic under certain conditions, such as an over-abundance of isopods and an under-abundance of other food sources. Isopods may become a nuisance by attacking plants in greenhouses and gardens, but these instances are far less frequent than for insect pests. Predators of isopods include birds, reptiles, amphibians, and several invertebrates including spiders, centipedes, and, when cannibalistic, other isopods. They possess repugnatorial glands which make them distasteful to some predators, especially spiders, which usually feed on them only when other sources are scarce. Isopods are occasionally attacked by parasitic insects, and young individuals are susceptible to certain soil fungi.

Like other Crustacea, female isopods carry the developing eggs in a marsupium or "brood pouch" on the ventral surface of the thorax. The size of the brood varies with the species and may range from 10 to about 250. The newly hatched young remain with the mother for varying periods of time and undergo their first molt within about 24 hours after emerging from the marsupium. At this time they resemble miniature adults and begin feeding. Young isopods are even more cannibalistic than adults, and the larger members of a brood may feed upon the smaller ones, especially while the latter are molting. Breeding generally occurs in the second year, and more than one brood may be produced by a single female each year. Isopods enjoy relatively long life-spans, and males of *Porcellio laevis* have been known to live as long as five years.

In October 1974, while exploring a wooded hillside on the edge of Waynesville, Haywood County, I encountered several individuals of the relatively large species, *Oniscus asellus*. This isopod is a European introduction and is generally considered to be a northern species in the New World. Published North American locality records include Greenland, Maine, Massachusetts, Rhode Island, New York, Pennsylvania, Michigan, and northern Illinois. No localities have been reported from south of the Mason-Dixon line, and the North Carolina site thus extends the range in this country some 400 miles southward. This may be an example of a basically cold-adapted species with a range extension down the Appalachians, as this phenomenon is fairly common among invertebrates. It is doubtful if *O. asellus* will be encountered in the Piedmont or Coastal Plain of the state, but other species are more widely distributed. *Ligia exotica* will be found only along the coast, and *Miktoniscus alabamensis* is apparently restricted to subterranean environments. The common household species of *Armadillidium* and *Porcellio*, however, may be expected in gardens and urban environments of all 100 counties of North Carolina.

Silver Phase Wild Turkeys Observed

In Madison County, North Carolina, September 1975, four pale mutant or "silver phase" wild turkeys were photographed and live-trapped along with eight normal colored turkeys. So far as I know, these photographs are the only ones ever taken of these off-colored birds in the wild. Two of the four mutants were yearling adults—the only adults captured (two birds escaped the net which is concealed under grass and leaves behind and to the right of the feeding flock). The other two mutants were young-of-the-year, one male, one female.

This type of mutant has been reported from several states—Alabama, Florida, Mississippi and Virginia (Williams, 1969). In discussing color aberrations in wild turkeys, Williams (op. cite) concluded that aberrancies arise independently and are not necessarily related to interbreeding with domestic stock. The Madison County flock containing the four color mutants was in a remote mountain area and nothing in its behavior suggested any relationship to domestic birds.

Literature Cited

Williams, Lovett E. Jr. 1969. A pale mutant wild turkey in juvenal plumage. Quarterly Journal of the Florida Academy of Sciences. 32(3). 3 pp. Illus.

R. Wayne Bailey,
Wildlife Biologist

MINI UNDERWATER NATURAL AREAS?

● The idea of an underwater natural area in North Carolina is not as far fetched as it might seem.

Of course it would not be Florida, but after looking at North Carolina's close-to-shore bottoms (mostly flat, monotonous, barren stretches of sand and silt), a diver can come upon select areas along our coast and think he has found a piece of the tropics. Contrast of drab to exotic is great.

On any of these few outcrops of rock is a surprising oasis of life. Utilizing hardness and stability, sponges and soft corals, at three feet or so, are the tallest living components. The sponges are shaped it seems by the hand of a child; humpy mountain ranges, sphericals, fat fingers pointing to the surface. Small encrusting reef builders have added and continue to add a mosaic coating to the rock. Some fish are vivid enough to qualify as tropics.

During the latter part of the 1940's, A. S. Pearse of Duke University and Louis G. Williams of Furman University, Greenville, S. C., studied the abundant plant and animal life found in the rocky outcrop area just south of New River Inlet.

From this outcrop they collected 298 species of microscopic sea creatures, plus 104 species of algae (plant life). Starfish, urchins, fish, shelled creatures—a patchwork of shapes and colors and textures.

The rock is by no means tabletop smooth. Cracks and crevises and caves and five foot cliffs and a jut here and there are fun. Neat places for fish to live.

Fortunately, the areas are not miles at sea in deep water, but within two miles of the beach, even within a half mile in one area.

A movement is under way to somehow protect these unique areas for future generations, and at the same time guide the uninitiated to them today.

"The logical procedure now," according to Dr. Bob Teulings, Division of Parks and Recreation, "is to recommend the reefs be designated State natural areas. Some formal designation of sites would be recommended to the Secretary of the Department of Natural and Economic Resources by the N. C. Marine Fisheries Commission. At least this is the way we see it now.

"The idea behind a State natural area designation is permanent management and protection to keep the area's natural characteristics and see that no incompatible use would occur there.

"Management and patrol of the sites would probably fall under the Division of Marine Fisheries."

Edward G. McCoy, Director of the N.C. Division of Marine Fisheries concurred with the opinion of State Parks personnel. He believes the Division of Marine Fisheries would be the appropriate sponsoring agency for such a program and his agency is interested in assuming the management responsibilities. The N. C. Marine Fisheries Commission agreed that a marine natural area program should be the responsibility of the Marine Fisheries Division.

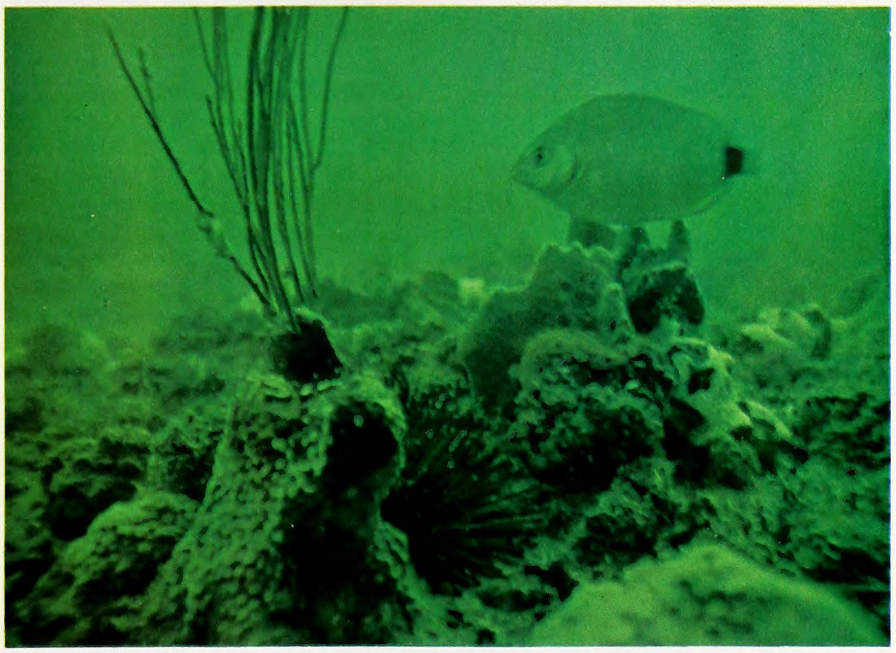
Due to the distance from population centers and the difficulty of access, and also the areas are small, a few hundred yards by width and length, the areas could be said to be wet counterparts of designated wilderness areas on the land. It is anticipated that visitors to the areas would be minimal if some type of official protection and identification came to be.

Looking to the future, though, as more and more North Carolinians enter the water and stay down for several minutes at a time, it seems a good investment for the State. SCUBA equipment gets more refined and easier to use each year. A noted shark expert is looking to the near future for an easily applied chemical coating to wet suits to repel sharks (which, by the way, only two documented shark attacks in N. C. waters are on the record book).

And this could be only a start. North Carolina's territorial waters could extend soon to 12 miles offshore (presently it is three miles) and put more and better rocky outcrops under State jurisdiction. And the near future could finally be the years when we get serious about the ocean. Captain George Bond, M.D., Navy, inventor of saturation diving and living in underwater habitats, predicts, in the year 2000, the

The proposed area off Topsail Island contains many varieties of sponges, fish (spottail porgy, lower right) and other interesting forms of marine life. These photos were taken with available light, and the visibility was limited to 10 to 12 feet. If these areas are designated as natural areas, all life found there will be protected. Regulations yet to be formulated will likely permit diving, photography and observation of underwater nature.

TEXT AND PHOTOS
by Jim Tyler
Div. of Sports Fisheries



average SCUBA diver will be able to go down to about 600 feet depths and work for hours during one dive. He predicts 12.5 million American people will have to go into the sea in the year 2000 to perform work absolutely necessary for survival of the country.

Threat of pollution is very real on the rocky outcrops. The idea of shoving beach community sewage into a long pipe and letting it disperse out of sight a short distance offshore comes up again and again.

A designation of natural area could give some protection to the reef communities.

The water would never be clear enough for the glass bottom tour boat approach. The idea is simply to buoy the areas to let divers know the locations. No shore facilities are planned. Perhaps in the future underwater trails and a picture book to identify reef things could be started.

Three possible areas have been selected. All three should someday have some kind of protection and identification designation. There could be other suitable areas. The N. C. Division of Marine Fisheries, Reef Project, P. O. Box 769, Morehead City, would welcome any other suggestions.

Possible Site Near New River

On Coast and Geodetic Survey Chart 1235, three clumps of rock outcrops are outlined 1½ to four miles south of New River Inlet. The closest clump is 1¼ miles from shore and water depth over the clump is 30-35 feet. The area is immediately adjacent to a N. C. Division of Marine Fisheries artificial reef where construction began 2 December 1975.

Possible Site Offshore Topsail Island

One proposed area, offshore the southern portion of Topsail Island, is a rise of rock 1¾ miles offshore in 43 feet of water. A cursory survey revealed maximum profile of five feet. The northeast-southwest dimension is approximately 700 nautical yards and the area extends seaward some 200 nautical yards. The area is about 400 yards southwest of an artificial reef.

Possible Site Offshore Masonboro Island

On Coast and Geodetic Survey Chart 1235, approximately 4½ miles south of Masonboro Inlet, and about one-half mile from the beach, a circle rock outcrop is outlined.

A rocky area in that area is known by locals and reportedly heavily fished. The area has not been pinpointed and it is not certain that the area on the chart is indeed the rocky area investigated by State divers, but the location is close.

Profile can vary 10 feet within 20 linear feet. Depth of water above the rock is 20-30 feet. ◆

Social and Ethical Considerations in Conservation

By Robert E. LeResche

One of the speakers at the National Wildlife Federation's annual meeting in March of 1974 was Alaska Game and Fish Department wildlife biologist Bob LeResche. You may or may not agree with his remarks reprinted here, but it is one approach to the continuing problem of anti-hunting sentiment in our country.

THIS afternoon I will address the social side of conservation in the belief that this is where the crux of many emerging issues lies. In so doing I will consider not how we might "achieve and maintain variety and optimum numbers of wildlife," but rather how we must "achieve and maintain variety and optimum levels of human experiences with wildlife." I will speak to (those) people who seem continually determined to argue with one another, but whose objectives are in fact close to identical. These are hunters (and) those who would abolish hunting . . . . . While these groups debate and in-fight over what constitutes proper use of wildlife resources, others continue the blind march of ecological suicide that must one day eliminate any choice we have in the matter of variety and numbers of wildlife. Let our common goal to be the perpetuation of a variety of human expression in what is left of our natural world, and let our common enemy be those who would destroy this natural world and thereby eliminate a priceless potential for human experience.

To The Hunter

By now it is aphorism that the hunter is an endangered "species," and that social and ethical concerns of non-hunters are the basis for your precarious position. You have come to realize that despite the philosophical impossibility of debating "taste" or personal ethics, your actions are suddenly socially unacceptable. Your public image is low and declining, and you are worried and perplexed. Recent essays have explored anti-hunting sentiments and have clarified how others see hunters. Arguments against hunting have recurrent themes, but can be divided roughly into three categories: The "cruelty argument"; the "uncivilized argument"; and the "ecological argument." The first two can only be answered by personal opinion—for that is all they are themselves. There is some rational basis for the third. I feel it is very important that hunters take each of these seriously, however, for there are millions of people—people who vote and thereby control America's public land—who sincerely feel them. You have ridiculed and laughed them off too long.

The Cruelty Argument is straightforward—killing is cruel. Wild animals are happy and innocent until man comes on the scene with his roaring machines, traps, and big guns. The animals he kills suffer, their bereaved friends and relatives mourn their loss. Their offspring are left to starve. The answer, you say, is simple . . . . ridiculous! Don't put man's feelings onto animals. They have no emotions. . . . But as one tries to develop this counter argument the real truth becomes plain—there is no proof of either side, and "their" ideas are as true to them as yours are to you.

The Uncivilized Argument is more insidious and a little less fair, for it attacks the hunter rather than the act of hunting itself. Hunters are culturally immature — throwbacks to the caves or at least to the dark ages. Or, worse yet, they are sexually inadequate, and their guns are merely extensions of Freud's cigar. In short, hunting is below contemporary human dignity and hunters are unfit for today's society.

Counter-arguments to this are many and fascinating. Man evolved a hunter, still retains the trait, and a healthy human personality accepts, rather than represses, its true nature. Hunting is a better outlet for man's inherent aggressiveness than is war. Or, simply a direct reversal — a natural human being can be defined as one who hunts.

The Ecological Argument maintains that hunting endangers the ecological balance, and may lead to extinctions. Look at the passenger pigeon, the bison, the great auk. Look at how many more moose and grizzlies one can see in McKinley Park than in other parts of Alaska, where hunting is allowed. Look how the walrus and seals and polar bear were almost extinct before we saved them with the Marine Mam-

mals Protection Act. Lucky we forced the Fish and Game to close that doe deer hunt—they'd have killed off all the deer. They are all the same argument.

These criticisms sometimes are at least rational, though often based on misinformation. In some cases, they may even hold merit. We all know that since the advent of modern game management no species in North America has been severely depleted by legal sport hunting and many have benefitted tremendously. We also know that sport hunters have been the single strongest factor in preserving all kinds of wildlife and wild lands over the last few decades and in financing the work that has taught us what we know of wildlife ecology. But hunters must also admit that the advent of the aircraft, the ATV and the snowmachine, without a simultaneous development of a new ethic for their use, *has* endangered the ecological balance and made proper management and preservation a struggle, at best. You must admit that indiscriminate shooting, crippling losses and illegal or unreported kills and harassment of game by hunters probably *have*, in fact, decreased some populations and redistributed others. You must realize that in today's world, arguments about the ecological *necessity* of hunting are absurd. To save hunting, hunters will have to admit these things and do something about them—Fast.

There is a recurrent theme in all anti-hunting arguments: The hunter is a slob. He thinks *only* of killing. He has no respect for the rights of other humans or other animals. Can you deny this categorically? Do you like all who call themselves "hunters"? I hope not.

It has been said that "America is the only nation that has gone from barbarism to decadence without creating a civilization in between." I wonder if that does not all-too-truly describe the development of our hunting culture in this country? The days of non-regulated market hunting may have merely faded into the days of mechanized, no sweat, kill 'em and take 'em home hunting, and it is hard to discern any culture or set of ethics that developed in between. I know it is there, somewhere, but it is difficult for a non-hunter to see. Stating a civilized set of ethics loud and clear—by deed much more than by words—is in my mind the only salvation for the sport of hunting. Psychologists tell us, "people don't like what they fear, and they fear what they do not understand." So what we are talking about, you say, is education. Maybe so, but what I'm *not* talking about is news releases saying "The National Wildlife Federation explained today that they have ethics and love animals." As one who has "explained" cow moose hunting before more than one town meeting, well I know that in the real world the quickest way to alienate someone is to give him a lucid, hard-hitting rational explanation he never asked for.

How do we educate people to believe in hunting, then? The best way I can summarize it is by educating them to believe in hunters. Let me list several specific suggestions.

First—Sit down alone with yourself sometime soon and decide, "what *are* my own personal ethics regarding hunting and conservation"? That question is more difficult to answer than you might think but the answer will come. Then—*consciously* stick to these ethics, whether in a crowd or in the wilderness 100 miles from the nearest human. How many of us have—just once—chased an animal with a snowmachine? Hazed one with an aircraft? Failed to kill cleanly and humanely? Left just a bit of edible meat in the field? Hunted a species we knew little about? Forgotten for a moment that hunting is much more than killing something and getting home fast? Ethics have a way of eroding very quickly at the tiniest breech.

Once you know your principles and follow them yourself, talk about them. Don't ignore acts by other "hunters" that are wrong in your eyes. You can't make that fellow who just shot from the road share your ethics, but you *can* let him know you find his behavior offensive. Have an opinion; anti-hunters certainly do.

Second—Don't be defensive about hunting. Don't say "it isn't any worse than letting animals starve," or "the game can take it." Hunting is not merely the lesser of two evils. With the pride you have in your principles and in the fact you follow them without exception, and with the biological knowledge you have, you need not be ashamed of hunting. In fact, if you are ashamed of it, why do you do it?

As a corollary, never get into a position where you defend *all* hunting. Admit there *are* some slobs who hunt (there are also slobs who belong to anti-hunting groups), and make it plain you disapprove of them as much as anyone does. Many practices lumped in the public's mind under "sport hunting" *are* despicable.

Third—Accept the fact that anti-hunters are sincere, that many people are actually made ill by the sight or even the thought of a dead wild animal. They don't deserve to be written off as "kooks" any more than do hunters. So have some concern for the sensibilities of others. Take them seriously and try to understand them. Practically translated this means asking what do I gain by leaving a gut-pile in view of the road, by tying a bloody deer carcass on the hood of my car, by carrying an easy rider gun rack full of loaded firearms in plain view in my pickup? These acts are nothing less than gross disrespect for the sincere feelings of others.

Fourth—Acknowledge — personally and as a group—that there are other legitimate uses of wildlife than hunting, and support them where appropriate. Never forget that wildlife belongs to all the people, not just to hunters. Be as sure that viewing areas and study areas are established as you are sure that hunting is preserved. No one who really understands the natural world is against hunting, and the more chances we provide for people to learn about ecology the better off we'll all be. So support a suitable number of closed areas, walk-in areas, and parks, where other important uses might be severely degraded by hunting. (Don't though, make the mistake of thinking hunting is always incompatible with non-consumptive uses. With proper management and seasonal zoning they are compatible in a vast majority of cases.)

Finally — Become a naturalist. Learn all you can about wildlife and ecology. I guarantee it will enhance the pleasure you get from hunting. It can do nothing but good for the average hunter's image when he can intelligently talk about "healthy ecosystems" instead of "more shootable game," and when he knows as much about the fantastic migrations of the Arctic Tern as he does about the relative merits of a lung shot and a shoulder shot.

Try some of these things and you may even respect hunting more yourself. You'll certainly earn the respect of non-hunters, and maybe even of an anti-hunter or two. ▲▼

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

"Opening Day" for Trout

Although "Trophy" waters and impoundments are open the year round for trout fishing, other trout streams have been closed since February 29, and the "traditional" opening on all waters is April 3. A special Trout License is required in addition to the regular fishing license when fishing in designated public mountain trout waters.

Public Hearings on Hunting Regulations

These dates are listed on page 20, in an article about these meetings.

Wild Turkey Season

April 10-May 1 in and east of Rockingham, Forsyth, Yadkin, Iredell, Catawba, Lincoln and Gaston counties (bearded turkeys only).

April 17-May 8 in and west of Stokes, Surry, Wilkes, Alexander, Caldwell, Burke and Cleveland counties (bearded turkeys only).

Gates County is closed to all turkey hunting. A special big game license is required in addition to a regular hunting license; all turkeys killed must be tagged and reported to a Wildlife Cooperator Agent.

Leave Young Wildlife in the Woods

The new crop of wildlife will soon be arriving. When you find a young wild animal, leave it alone. Chances are good that the parent is nearby; and it's unlawful to take or possess these young animals.

Waterfowl Regulations

Restrictions might be eased on the hunting of canvasback and redhead ducks this fall, and the season for snow goose hunting along the Atlantic Coast might be extended from 30 to 50 days, according to the U.S. Fish and Wildlife Service. Public comment on this and other regulation changes should be submitted to the Director, (FWS/MBM), U. S. Fish and Wildlife Service, Washington, DC 20240, before May 1, 1976.

Stem to Stern

BY ED JENKINS

THE federal Personal Flotation Device regulations as they apply to motorboats were adopted by the North Carolina Wildlife Resources Commission on February 1, 1976. The federal requirements have been in effect on waters subject to the jurisdiction of the United States since October, 1973. The recent adoption of these regulations by the Commission has standardized the personal flotation device (PFD) requirements with which motorboat operators must comply.

The new regulations classify personal flotation devices by "Type." The number and "type" PFD's required on a motorboat depends on the length of the boat and whether the boat is used for recreational or commercial purposes.

Recreational Motorboats

1. All recreational motorboats less than sixteen (16) feet in length must have one Type I, II, III or IV device of a suitable size for each person aboard and each skier being towed.
2. All recreational motorboats sixteen (16) feet in length and over must have one Type I, II, or III device of a suitable size for each person aboard and each skier being towed and, in addition, one throwable Type IV device.

Commercial Motorboats

1. Each commercial motorboat not carrying passengers for hire, less than forty (40) feet in length must have at least one Type I, II or III device of a suitable size for each person on board.
2. Each commercial motorboat carrying passengers for hire and each commercial motorboat forty (40) feet in length or longer not carrying passengers for hire must have at least one Type I device of a suitable size for each person on board.
3. Each commercial motorboat twenty-six (26) feet in length or longer must have at least one ring life buoy on board.

Know How to Use Your PFD

- **Fit and adjust it to the person who will wear it.**
- **Wear it in rough water or threatening weather.**
- **Have children and non-swimmers wear it at all times.**
- **Keep it clean.**
- **When wet, thoroughly dry before storing.**
- **Test it annually.**

Ski belts are not approved Personal Flotation Devices. If your skier is wearing a ski belt, he must have a Coast Guard approved device on board.

Note: While North Carolina law and regulations concerning Personal Flotation Devices apply only to motorboats, Federal law requires all boats on waters subject to the jurisdiction of the United States to carry the appropriate type and number PFD's. ◆

All children and non-swimmers should wear a PFD when boating. This youngster is being fitted with a Type III Personal Flotation Device.

Types of Personal Flotation Devices

Type I

A Type I PFD is an approved device designed to turn an unconscious person in the water from a face downward position to a vertical or slightly backward position, and to have more than 20 pounds of buoyancy. Recommended for offshore cruising.

Type II

A Type II PFD is an approved device designed to turn an unconscious person in the water from a face downward position to a vertical or slightly backward position and to have at least 15.5 pounds of buoyancy. Recommended for closer, inshore cruising.

Type III

A Type III PFD is an approved device designed to keep a conscious person in a vertical or slightly backward position and to have at least 15.5 pounds of buoyancy. While the Type III has the same buoyancy as the Type II PFD, it has less turning moment. It does, however, allow greater wearing comfort and is particularly useful when water skiing, sailing, hunting, or engaged in other water sports. It is recommended for use on lakes, impoundments, and close inshore operations.

Type IV

A Type IV PFD is an approved device designed to be thrown to a person in the water. It is not designed to be worn. It is designed to have at least 16.5 pounds of buoyancy. The most common Type IV device is a buoyant cushion. A ring buoy is also a Type IV device.

All Type I, II, and III PFD's must be U. S. Coast Guard approved, in good and serviceable condition, readily accessible, and of appropriate size for the wearer.

All Type IV PFD's must be U. S. Coast Guard approved, in good and serviceable condition and immediately available to the user.

Hunting Regulations: Sportsmen Have a Key Role

by Jim Dean

• Most hunters have cleaned their guns, saddle-soaped their boots and put away their gear by this time of year. After all, except for the spring gobbler season, April is not much of a hunting month.

And yet, for the sportsman who is concerned about proper wildlife management and regulations, April is a critical month because that's when the public hearings are held each year to consider proposed changes in next fall's hunting regulations.

It's an opportunity for all sportsmen across the state to offer their suggestions, opinions and comments about changes being proposed for the 1976-77 hunting and trapping regulations for North Carolina.

The public hearings—held at nine places across the state—are an important part of a process which actually begins much earlier when suggestions for regulation changes are gathered by the Commission's Divisions of Game and Enforcement. These suggestions, which come from hunters, biologists and others, are collected throughout the year. Then, in late winter, the Division of Game and Commission Enforcement personnel consider each suggestion (there are usually quite a few). Those suggestions which have merit are presented to the Wildlife Commission by the staff and the nine-member Commission considers each recommendation—adding some, dropping others and making various changes.

Then, the proposed changes are publicized and carried to the nine public hearings, "It's at the public hearings that we learn whether these proposed changes have the support of the sportsmen," said a Commission spokesman. "We take all the suggestions from the public hearings, along with comments received from letters, and then we review each proposal change again in light of what we've learned at the public hearings. We also review each proposal from a biological standpoint. Our goal is to propose regulations which are both biologically sound and which also have the support of the majority of sportsmen statewide."

After this final review, the Wildlife Commission will meet again (on Monday, May 24) to adopt the final changes in the regulations. The 1976-77 North Carolina Hunting and Trapping Regulations are then published and made available through license agents prior to the opening of the fall seasons.

Attendance at the public hearings varies from place to place, but there are often several hundred sportsmen attending each hearing. If you're interested in sound management and good hunting regulations, you should plan to attend the public hearing nearest to where you live.

As you enter, you'll be given a pamphlet outlining each proposed regulation along with a brief summary of the reason or reasons why the regulation change is being proposed. Each proposal will be considered, and the floor will be open for comments. The North Carolina Wildlife Resources Commission hopes you'll attend and offer your comments on this year's proposed changes in the hunting regulations.

The following is a schedule of public hearings to be held concerning proposed changes in the hunting regulations for the 1976-77 season. Each will begin at 7:30.

April 12	District 1	Edenton	Courthouse
April 13	District 2	Jacksonville	Courthouse
April 14	District 3	Louisburg	Courthouse
April 15	District 4	Elizabethtown	Courthouse
April 16	District 5	Graham	Courthouse
April 20	District 9	Sylva	Jackson County Community Service Center
April 21	District 8	Morganton	Western Piedmont Community College
April 22	District 7	Yadkinville	Courthouse
April 23	District 6	Albemarle	Central Elementary School

The Right Fly: Does It Matter?

By Jim Dean

FISHING

PHOTO BY JIM DEAN

● The fisherman stands at mid-stream. Ahead of him, the water froths down a rocky chute then fans out into a long, shallow run. Under the edge of some overhanging rhododendron, several trout are rising. The angler casts his fly, but catches nothing. All day, it has been like this.

"If only I had the right fly," he mutters.

This is not an uncommon situation for the beginning fly fisherman, but chances are that his diagnosis of the problem is—in itself—one of the problems.

There are many reasons why a novice fly fisherman might fail to catch trout, but having the "wrong fly" is not usually one of them, and that is especially true in the streams of western North Carolina.

Lack of success for the beginning angler is usually a simple matter of inexperience—poor stalking, lack of knowledge of the water and preferred trout lies, sloppy casting, etc. While the choice of fly may occasionally make a major difference, this is rare. It is true that switching from dry flies to nymphs can frequently be a matter of considerable importance, but the exact choice of pattern is not often critical.

Most of the beginning trout fishermen I've known go to great extremes to buy or tie as many different fly patterns as possible. I did the same thing, and some years ago, I counted the flies in the boxes in my vest and found I had over 600. Of these, there must have been at least 100 different patterns. And yet, over the years, I've found myself using fewer and fewer basic patterns, especially when fishing streams in the southern Appalachians.

In recent years, I've narrowed my favorites to a mere handful. I still carry a lot of flies (I think primarily because I like to tie them and experiment), but I rarely "need" them.

The reason is quite simple. Wild trout in the southern Appalachians react differently from trout in some other parts of the country. Our trout live in streams where food is relatively scarce, and matching the hatch is rarely necessary. Most patterns, properly presented, will catch fish. On the other hand, our trout are very spooky. If they see you, they're gone. In many northern and western streams, the trout are not so easily spooked, but matching the hatch will often be the key to success.

I point out this difference primarily to save the beginner a lot of unnecessary anguish. If you know, for instance, that North Carolina trout are not often selective, then you can stop worrying about your choice of fly. Instead, you can concentrate on the more important factors of approach and technique.

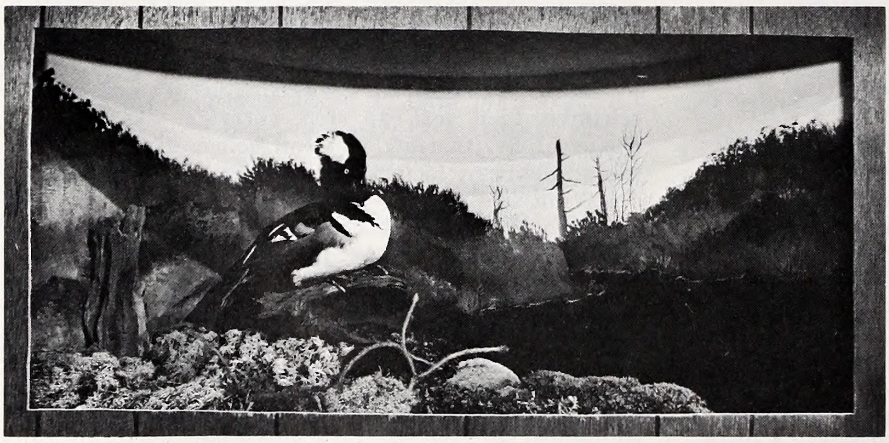
Having said that, let me suggest a smattering of fly patterns which have stood the test of time in North Carolina waters. If you can't consistently catch trout on these flies, then something is wrong with your technique.

Most of the expert southern fishermen favor Wulff-type dry flies, not only because they catch fish, but because they float well and are highly visible in our turbulent streams. Of the various Wulff patterns, the Wulff Royal, Blonde Wulff and Gray Wulff are perhaps the favorites, especially in sizes 10, 12 and 14. The famous Thunderhead fly is basically a Gray Wulff with brown hackle and tail. Most Wulff patterns have white wings, though the blonde usually has buff-colored wings.

Don't be reluctant to fish a large dry fly. One of the best fishermen I know rarely uses anything smaller than a size 12 dry, and more often fishes with a size 10. He rarely fishes for anything but wild browns, but he almost always catches more fish than anyone in the group.

You can even fish Wulff patterns when smaller flies are needed. I tie and use Wulff-type flies down to size 18, but instead of using calftail for the wings, I use white polypro yarn tied sparsely for the smaller patterns. It's much easier to handle and makes a handsome, high floating fly.

● **FISHING continued on page 27**



Displaying Wildlife

Almost a year ago, Sam Capps (above, right) of Fayetteville, began thinking about National Hunting and Fishing Day in September and how the Cumberland County Wildlife Club could provide the sportsmen and other citizens of their area with a first-rate exhibit. The idea of waterfowl natural habitat scenes began to grow, and grow, and grow. From the drawing board to the finished products shown here, are untold hours of work on Sam's part. The wood duck scene is more than 14 feet long and contains natural vegetation he collected, including cypress trees and knees.

The bufflehead scene (left) is considerably smaller, but just as detailed and finely done. The flying scaup adds still another dimension to the total display. The taxidermy work was planned by Capps and executed by Beulah Logan of Chapel Hill.

Such an exhibit was a great success, needless-to-say, but unfortunately a permanent home for all this work, a place where folks can see it, is hard to come by. It is housed in the Cumberland County Wildlife Clubhouse, but Sam would like some suggestions for a public exhibit spot for it.

PHOTOS BY STEVE ALDRIDGE

"T'WAS ALL BECAUSE OF ME!"

I watch the golden sun appear,
The grass with dew, just like a tear;
But sparkling in the daily light,
It makes the world seem twice as bright
The bird has left his cozy nest,
To sing his song, now for food, in quest;
His gay melody drifts on the breeze,
To awaken the flowers, the shrubs and trees.
Animals in their beds and den,
They too hear the symphony once again;
And each one from his rest doth arise
To roam the earth 'neath down-lit skies;
The bubbling brook with freshness filled,
Reaches a falls, its contents [illegible]
And in the spray a [illegible]
Promising Man, [illegible]
But then a tree [illegible]
Already too late, [illegible] to shame;
I hear the creatures [illegible] then flee
Then stop to think, "T'was because of me!"
Many men are sent to [illegible]
The battles lost for [illegible]
And then the war is [illegible] just,
Still lingering on, the priceless cost!
The trees are black and fallen down,
Erosion takes away the ground;
A tear-filled fawn gasps her last breath,
To the forest 'tis known as the "Evil Black Death!"
The streams infiltrated with dust and debris,
The fish float on top, "T'was all because of me!"
Tomorrow the sun will rise just as before,
But the life of the forest will be there no more!

George G. Glass, Jr.

My Love Affair with Carolina Toms

by Frank Mooney

Check your Hunting Regulations for the April-May turkey seosons, toke beorded turkeys only, be sure to hove your big game license in addition to your hunting license and report your kill to the neorest Wildlife Cooperator Agent.

I'M no masochist, but I've been bit, stung, sucked-on, crawled-on, rained-on, left red-eyed, muscle cramped and all because of the Carolina Toms. I been duped more times than I care to remember by these regal birds, and what's so bad I always return for more of the same treatment. I have flunked-out with the spring gobblers so many times, I'm beginning to wonder if I am a born loser.

Yes, I have some magnificent gobblers to my credit, that helps to keep me going back. But sometimes when I have waded icy streams in not-so-waterproof, leather boots, have had love-lorn gobblers snub their nose at my yelping, then to have some green hunter stalking me flush the gobbler ahead of me, I wonder why I keep coming back for more of this same treatment.

Some people have a drinking problem, other die-hards are suckers for dice and cards; mine is spring gobbler hunting. I seem to go into a trance when this time of year inches around. I can hardly wait for the season to open and after three weeks of sloshing in ice-water streams, plowing through briar thickets, getting lost and losing weeks of sleep and becoming almost incompatible with everything, I can hardly wait until the season closes!

Season before last, Jimmy Cates and I were confronted with two Carolina Toms the first part of the season who willfully had the woods ringing with their lusty calls. I had goose bumps on top of goose bumps as we tiptoed near the pine-strewn ridge. Their booming gobbles were as sweet to my ears as any string concert I had ever heard.

Hurriedly, we concealed ourselves about 30 yards apart near a dry, brush filled gully. One turkey continued to strut up and down the ridge as the morning sun warmed the chilled air. Leg cramps, gnats and mosquitoes continued to pester me as the morning wore on. After much wishful thinking and some plaintive hen yelps I was beginning to think that this was another fruitless morning.

Suddenly, I decided to switch ends of my box call and see if this love-lorn tom would be jealous of another gobbler intruding on his home territory. After a couple of gobbles the hen who was keeping the gobblers company almost ran over Jimmy in her haste to reach what she thought was another gobbler. The big gobbler was flanking the hen. Jimmy's magnum loads of sixes helped to thin the pine saplings as the big tom flew safely away to another ridge.

One gobbler in particular I remember gave me more satisfaction in bagging than some others. Now don't get me wrong, bagging an amorous spring gobbler is always something special. It's as exciting as getting to go to town to sell tobacco after being down on the farm all year. It was getting way down in the spring season when I heard this tom before daylight. He was roosting near a field and I was sure my chances would be greater if I tried to call him into the woods instead of toward the opening.

I gave a slow series of yelps followed by a couple of clucks. His answer was spontaneous; he didn't gobble anymore, so I silently prayed he was on the way. When I first entered the woods I found a shallow ditch that ran from a ridge and crawled into it. It gave a good view of the west side down into the streambed. That gobbler came down the ridge on the side and I could hear his noisy steps in the dry leaves. Soft yelps or clucks would not pull him down the hill.

The next morning I was in the same ditch long before the predawn darkness gave way to daylight. The gobbler sounded off from the exact same position near the field and I immediately came back with three yelps. He gobbled again and I knew he had heard me and was interested. Within 20 minutes this tom was slowly working his way to my blind. I waited until his head was behind a tree before I shouldered my gun. That tom was in prime condition and made grand table fare.

I have had almost everything imaginable happen while calling spring gobblers. One morning in the predawn darkness I stalked within 100 yards of a love-sick tom who was telling the world that he was king of the forest. With scrupulous planning I selected the only small opening near the roosting tree in hopes that he would decide to land after leaving the tree.

After making a careful stalk and giving forth with a couple of sleepy clucks, I sat savoring the short span before the tom would leave the tree. A mongrel dog gave a sharp bark almost under the tree. Within min-

utes the gobbler lifted from the tree to sail a half-mile down the ridge. Later, he gave a vigorous gobble as if telling the hens if his services were desired they had better do the turkey trot.

Feeling the pains of defeat, I vividly recall the time I was competing with a turkey hen. After getting within 200 yards of a love-filled gobbler, I crawled into some brush and started calling. At first I thought another hunter was closing in on the tom but a receptive hen started calling about 40 yards from my hide. I would call and then she would call. The old monarch came within 70 yards before hanging up.

Suddenly the impatient hen let out with a string of whines like nothing I had ever heard before. It was almost frightening, the sound was between a bobcat howl and a love-sick owl. The old tom couldn't take it any longer, he gave a short, double gobble and ran to her. I needed two alka-seltzers bad.

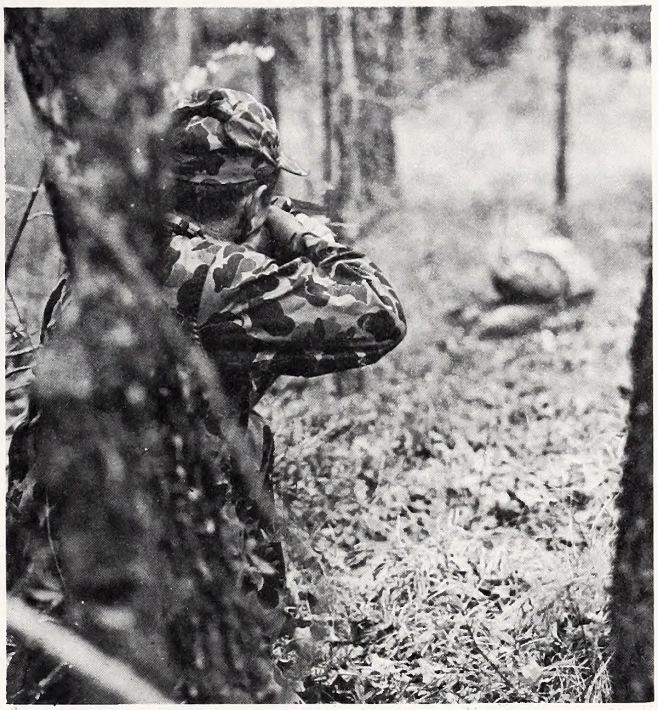
The way some unscrupulous hunters get between the caller and the incoming turkey almost sends me into a flying rage, for instance, the cold, cloudy morning I waded an icy, wet weather stream. Upon reaching the roosting site of a talkative tom who was almost out of calling distance, I sat down to rest and stroke the caller. From his reactions the gobbler had not had any lady friends that morning and was anxious for some company. Thinking I was a mile from the nearest road and no hunter within miles I proceeded to con him. He came reluctantly but came straight in before starting a slow circle to my right about 60 yards out. Without knowing, I had gotten into some thick pines and the turkey was skirting the dense brush.

Knowing how a tom turkey dislikes thick brush, I was helpless since the gobbler was so close. Suddenly, a shot rang out near the last place the tom had gobbled. After all the time spent calling and someone else getting my shot I was mad as a wet hen and shortly got soaked to the skin as a sudden shower drenched the forest.

What is so hard about trying to shake the turkey fever? The little man inside me with the prodding voice keeps me going when all other hopes had died. "Maybe just this trip will be the one. You can't shoot that boss gobbler unless you are on his home ground." Then I'm up and walking through the woods bleary eyed thinking this could be the day I have been waiting for.

Many older turkey hunters were brought up believing that the art of turkey calling was almost a sacred endeavor. To this day many experienced hunters say once a gobbler answers, not to call anymore. No two gobblers are alike, like humans, some like their women more talkative than others. I have tried on occasions when an old wise tom has hung up on me, and after I had gone through my little bag of tricks with no apparent success I have even tried to bend one's ear with all kinds of small talk. I have had turkey hens join in with their calling that would put a barmaid to shame.

This past season a young hunter on his first turkey hunt told me about his exciting day afield; I think his hunt will amuse you too. On opening day of the 1975 turkey season, the young hunter was lucky enough to hear a gobbler before sunup. With adrenalin flowing and heart pumping fast, he neared the magnificent bird. His excitement overcame his better judgment



U. S. MARINE CORPS PHOTO

The moment of truth, as they say; that instant which results from hours, days, weeks of work. Wild turkeys don't come easy and never will. But the author's persistence paid off this time (below).

and he yelped each time the tom gobbled,

Often a worked-up gobbler will gobble every two to three minutes and some even every minute. This went on for sometime but the gobbler would not come to the hunter. The young hunter was using a box call and the excitement was still in his eyes several days

later as he told me that after awhile the gobbler would only answer when he yelped on the gobbler side of the caller. During this time the tom had moved up a ridge and the hunter had circled the bird and gotten on the same ridge.

Sometimes later, an old hunter came to him and wanted to try his wing bone caller. He told the young hunter that he was calling too much and that he would try to call the turkey himself. Then the old hunter moved about 50 yards in front of where the young hunter was hiding and started to call. By this time the young hunter was not sure who was trying to con whom. As fate would have it, the gobbler would not answer the experienced hunter's call but came in to the young hunter and he blew the shot.

While this confrontation was going on between the tom and young hunter at the beginning of the hunt he told me about accidentally hitting the cedar box and making a loud, unturkey-like sound, but he came right back with a good series of yelps and the gobbler boomed again.

Several turkey hunters agree with me that being on the right side of a turkey plays a big role in getting the monarch to come your way. Most turkeys dislike coming toward a highway, an open field or crossing a river. I believe that most turkeys know which direction they will go once they fly down from their roost. On several occasions I have tried to call different turkeys on a certain river and each one traveled west when leaving the roost tree. Whether it's from instinct, habit or what I wouldn't venture to say but if you are in their direction of travel your chances are tenfold.

In the last several years of pursuing the spring gobblers, I have found that weather controls their mating urge possibly more than all other factors combined. Whenever the toms refuse to gobble, the receptive hens are at a loss to make contact with them. Some hens nest a considerable distance from the roosting tom and must fly or walk to his roosting site in the early morning to mate with him. And without his lusty gobble to guide them in, the search could very well be fruitless.

Spring gobblers seem to gobble more on clear, relatively calm mornings. This seems to occur with a moderate to heavy dew; I'm usually wet to my knees from the heavy dew by the time I have covered a short distance in the grass or weeds. Windy weather seems to be the worse enemy of the turkey hunter because it quiets the gobbler. I can remember only one morning when I heard a gobbler in extremely windy weather and the noise of the wind and the creaking of the trees kept me from locating the direction from which the gobble came.

Even cloudy weather dampens the spirit of the mating tom and rain usually stops the gobbling altogether; however, no spring gobbler goes by the rules but most toms react similar to the weather or weather factors which causes the temperature change. Regardless of how nice the weather is, if the gobbler's domain is constantly under fire with hunters tramping the woods, no half-wit gobbler will broadcast his roosting position.

Staying as far away from other hunters during this time of year can be one of the best moves of the avid turkey hunter; however, you must be in good turkey country. I have heard old, hunter-wise toms gobble only once or twice in the morning and no amount of seductive yelps or clucks would get them to give away their position again.

Learn all you can about the habits of this truly fine gamebird and even with a vast knowledge, lady luck has to play a part in your hunt to keep man, beast or fowl from stepping in at the wrong time.

To me, the spring gobbler season is the greatest time of the year. Time for the new growth to reach skyward with green shoots and towering buds. Time for the sexual awakening of the most magnificent bird alive, the turkey gobbler who can almost brow beat the hunter while making him happy to be alive and lucky enough to hunt another spring gobbler season.

PHOTO BY JIM STRICKLAND

BACK OF THE BOOK

- Letters
- Comments
- This & That

The 1976 North Carolina "Bicentennial Governor's Frog Jump," sponsored by Theta Chi Fraternity and Carey Wholesale Co. of Raleigh, will be held at Dorton Arena, Fair Grounds, Raleigh, at 1 p.m., May 1. Those interested in entering a frog in this historic (or is it hysteric?) contest should check with Ron Cook, Delta Rho Chapter of Theta Chi Fraternity, NCSU, 20 Maiden Lane, Raleigh, NC 27607.

TURKEY PRINT AVAILABLE

Guy Coheleach, world famous wildlife artist, has donated 500 prints of the wild turkey pictured on our back cover this month, to the National Foundation for Conservation and Environmental Officers. Contributors of $100 will receive one of these 25½ by 34 inch limited edition prints. The funds derived will provide financial aid to the children and families of conservation personnel who are killed or die in the line of duty. Send your check or money order to the above Foundation, 44 Main St., Clinton, NJ 08809.

KNOW YOUR ENFORCEMENT OFFICER

Rocky L. Hendrix

Wildlife Enforcement Officer Rocky L. Hendrix was born in Sparta, N. C. June 8, 1949. He is the son of Mr. Clarence J. Hendrix and Mrs. Fern E. Delp both of Sparta. Hendrix is a graduate of Sparta High School in Alleghany County.

Mr. Hendrix was first employed as wildlife protector in November 1971, and stationed in Alexander County where he still resides. Enforcement Officer Hendrix has attended Wildlife Recruit School, Basic-In-Service Defensive Tactics and Pursuit Driving Schools, and Radiological Monitoring Schools. He is a member of the Southeastern Association of Game and Fish Commissioners (Law Enforcement Section) and the North Carolina Association of Wildlife Law Enforceforcement Officers.

He is married to the former Gail Edwards and they have one son, Timothy Bryan age 5.

FISHING from page 21

One suggestion may be appropriate here. The new "no-hackle" flies have gotten a lot of publicity recently, but experience indicates they have limited value in the swift streams of the Appalachians. They work fine on flat water, but I think you'll be disappointed with them on turbulent stretches.

The old standby wet fly patterns still produce, but most fishermen have gone to nymph patterns when fishing sinking flies. Again, you don't need 100 different patterns. I fish nymphs a lot, perhaps as often as dry flies, yet I rarely use more than three or four basic patterns in a variety of sizes.

My favorite is a hard-bodied black sinking ant in sizes 12 and 14. Admittedly, this is a terrestrial insect rather than a nymph, but I consider it the best sinking pattern you can use for wild browns. The time-honored Tellico Nymph in sizes 10, 12 and 14 is another favorite, and I've decided that its effectiveness is due to its resemblance to several varieties of stone flies. You can get along quite well with just these two; however, there are several others that have proven their worth. One is a simple Muskrat Nymph. Another is the Sheepfly, which is basically a large Muskrat Nymph with brown hackle and tail, and grizzly hackle wings tied spent and pointed towards the rear.

One of my favorite nymph patterns is a simple, easy-to-tie fly I call "Alvin's Autumn." I tie it in all sizes from No. 8 down to size 18, but I use sizes 12 and 14 most often. Basically, it's a standard nymph with a medium to dark olive dubbed fur body and a black or dark gray overlay. (I use the dark breast feathers of a turkey). The tail and hackle are tied sparse and I use dark olive, dun or partridge (it doesn't seem to matter which).

Except for the ant, I weight all my nymph patterns with lead wire wrapped on the hook under the body. Some prefer to use tiny split shot and unweighted nymphs.

You may have other favorites which produce consistently, and if so, by all means use them. The flies I've suggested are simply that—suggestions. I've had excellent success using many other types of patterns, including caddis imitations, big stoneflies, emergers, streamers and lots of others. It's certainly fun to experiment, but I think you'll find the patterns I've named will fool our wild trout 90 percent of the time. ▲▼

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An objective of all levels of government should be to achieve and sustain a balance of the social, ecological, and economic benefits derived from natural resources. Without such balance none of the factors on the scale will be worth weighing.

Amid the cool, moist, highland forests of our State, there is a small, loud, reddish squirrel, sometimes called the boomer. His official name is red squirrel, and although it is listed as a game animal in the hunting regulations, it is likely hunted far less than the gray squirrel. More on this spunky little tree dweller can be found starting on page 4 of this issue. Painting by Bob Binks.

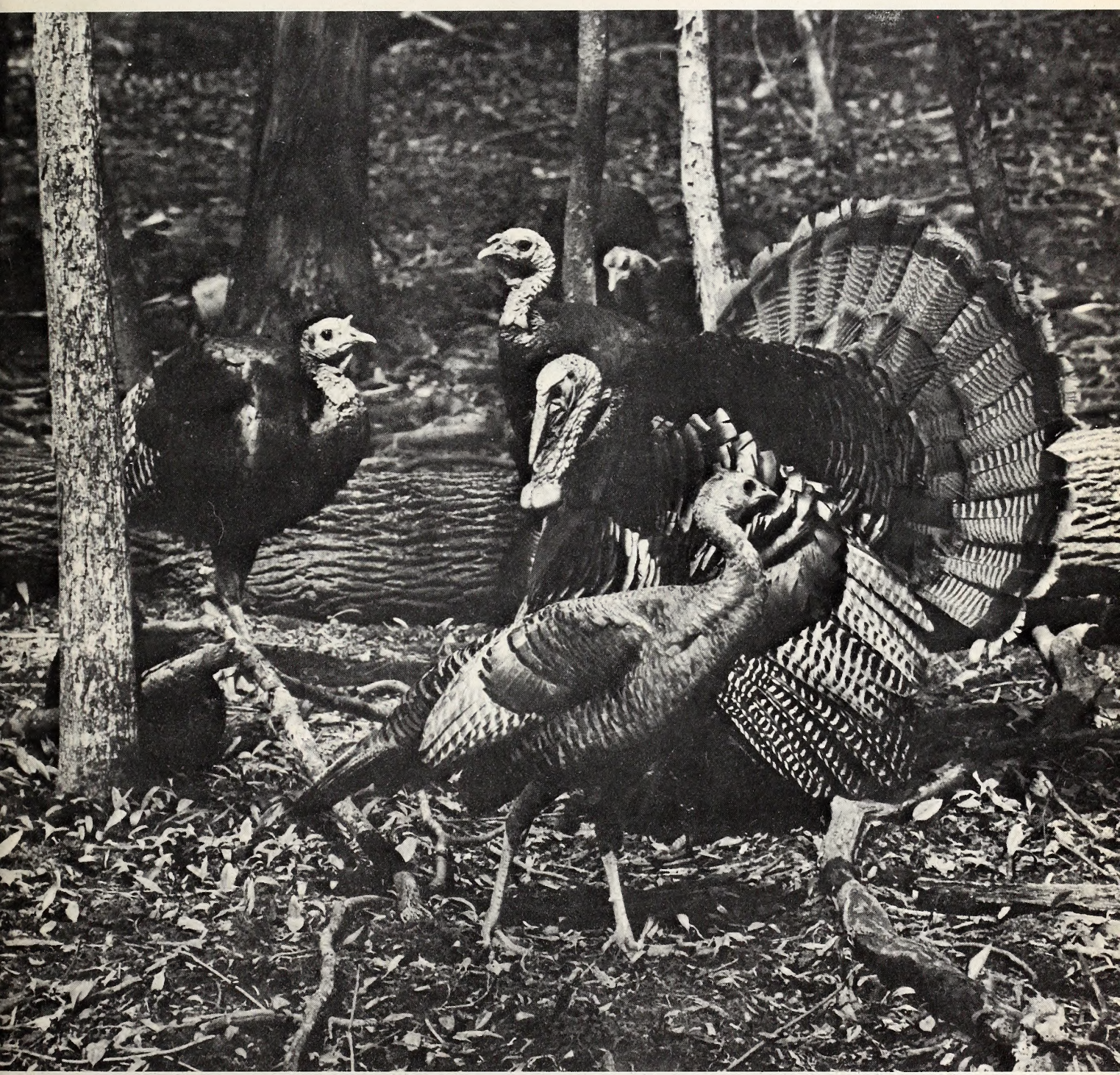


PHOTO BY LEONARD LEE RUE III

In The Spring...

Nesting is well underway for the wild turkey by now, and young birds should be hatching from now until mid-June. This spreading gobbler carefully watches his harem prior to nesting.

THE MOUNTAIN BOOMER

by B. Butler Lee

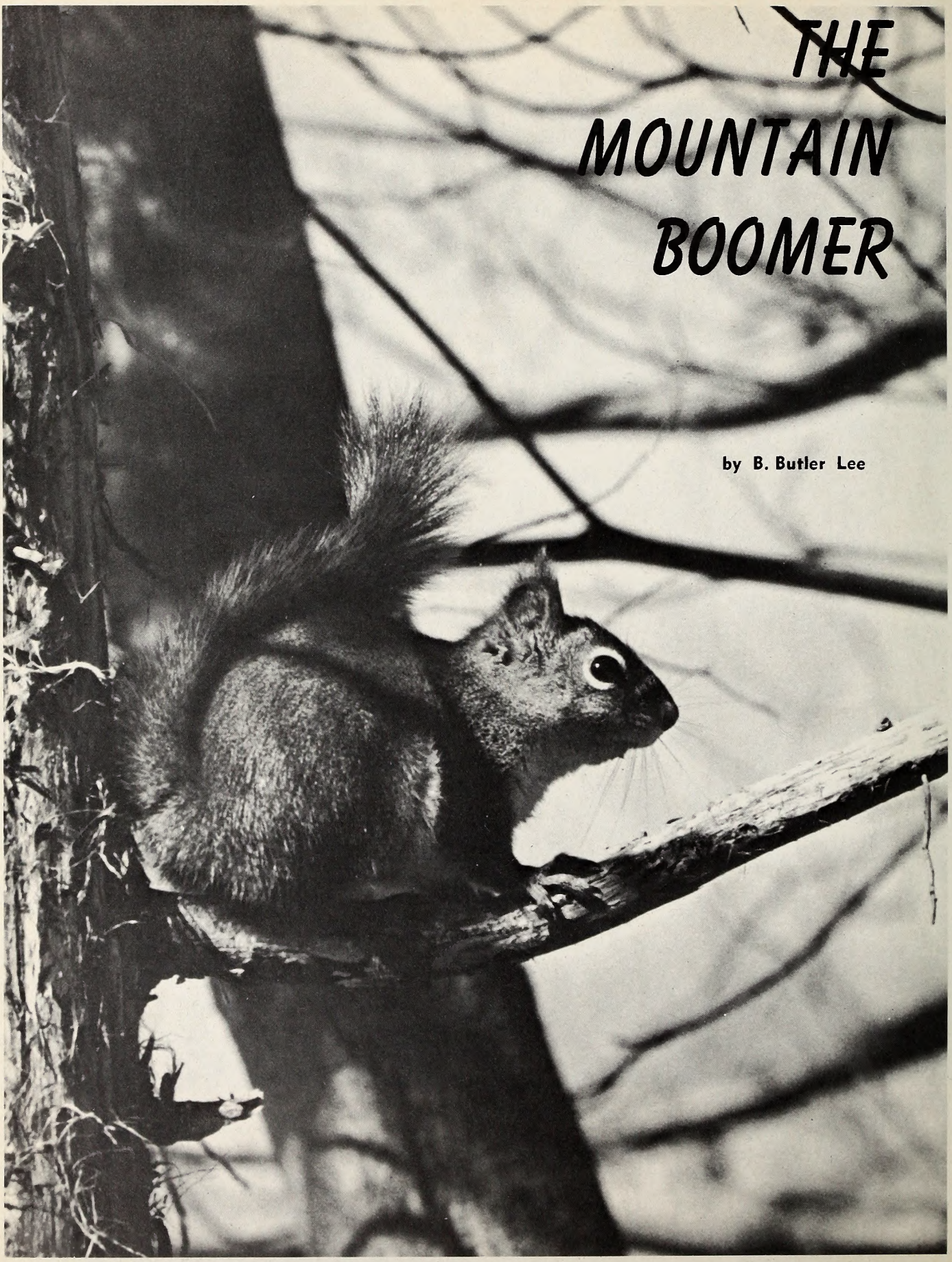


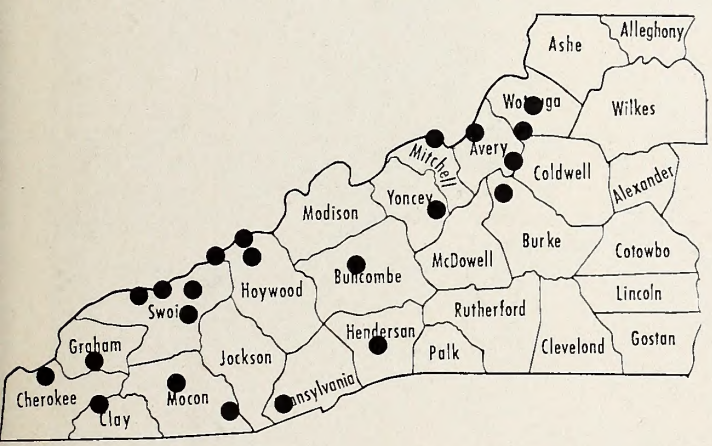
PHOTO BY LEONARD LEE RUE III

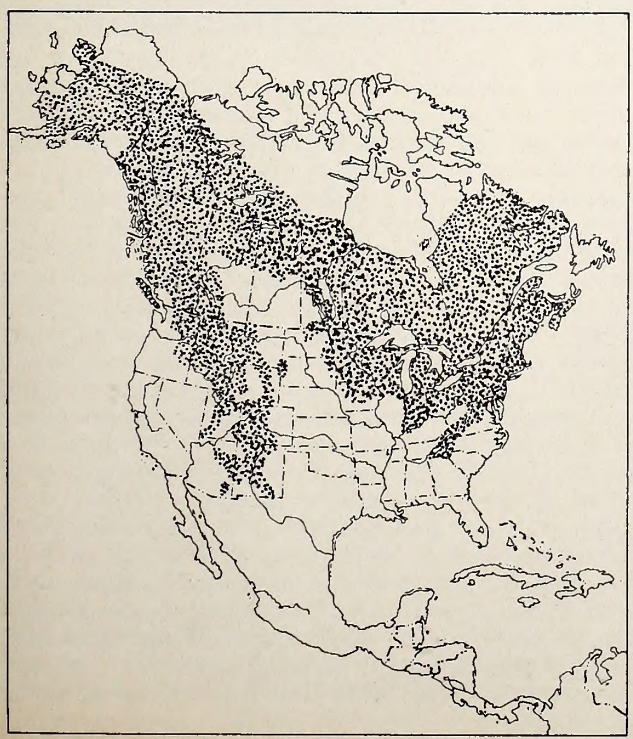
A rattling call of "chickaree-ee!" sounds through the forest. The Red Squirrel is a noisy rascal, his scurrying through the woods accompanied by grunts, chuckles, and chatterings. Many local residents of the southern Applachians know him as the "Boomer." Biologists call him *Tamiasciurus,* a combination of the name of the Chipmunk, *Tamias,* and that of the Gray Squirrel, *Sciurus.* This is because of certain characteristics of his anatomy and behavior which are intermediate between the two species.

The "Chickaree" is about half the size of the Gray Squirrel, and his coat is much rustier in color, becoming almost olive in summer. In a legal sense, it is considered a game species in North Carolina, as is the Gray Squirrel. In areas where the two share the same habitat, the smaller one is the fiercer competitor. Some squirrel hunters in Pennsylvania believe that the Red Squirrel castrates the Gray Squirrel when they fight; consequently, these hunters kill every Red Squirrel they see. As is often the case, this is a "tall tale" with a grain of truth to it—the Chickaree occasionally eats the young of the larger squirrel, thus cutting down on their reproduction.

However, the Red Squirrel does not usually live in the same type of woods as its larger cousin. Here in North Carolina it is mostly restricted to Hemlock and Spruce-Fir forests above 3,500 feet, although they can be found at slightly lower elevations in winter. Like these northern woods in which he lives, he is a relict of the past, when, during "ice age times," the boreal evergreen forest was forced south by advancing glaciers. As temperatures shifted again and the glaciers retreated, this forest no longer persisted throughout most of the southern latitudes. Only at higher elevations did temperatures remain cool enough to support these northern plants and animals. Today the "Boomer" and the Spruce-Fir forest where he lives both reach their southern limit near the North Carolina-South Carolina boundary. Here the Red Squirrels are distinct enough that zoologists call them a separate subspecies, *Tamiasciurus hudsonicus albieticola,* darker in color than those to the north.

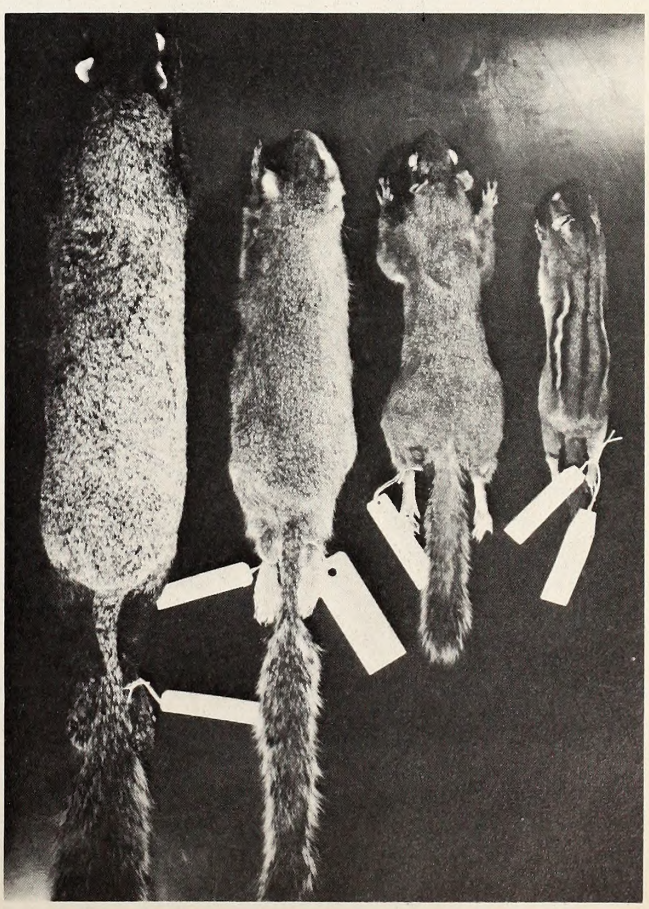
Mount Mitchell State Park has an abundance of





Red squirrels have been officially recorded at the locations noted on the map at left, but their range in the State is probably somewhat wider than indicated. The North American range of the red squirrel (below, left) coincides roughly with the forested, cooler regions. Relative size of four "squirrels" of our State, is indicated in the photo below. The fox squirrel is on the left, the gray, the red and the chipmunk in that order.

PHOTO BY THE AUTHOR



PHOTOS BY THE AUTHOR

This young red squirrel displays the lighter, more grizzled coat, but likely will acquire a more reddish or cinnamon color as he matures. This misty hemlock forest at right is typical red squirrel habitat. They seem to tolerate man, and may even welcome the camper's leftovers.

"Boomers." While camping there last summer I had an opportunity to watch and photograph some of these mischievous rodents. In many mountain camping areas Chickarees are a conspicuous part of the woodland scene. Unfortunately, they can also be a nuisance. Active in the daytime and on moonlit nights, they can be heard soon after dawn reminding campers that it is high time to get some food on the table. In their unending search for food, nothing is safe. Every container is a potential cache of hidden morsels, and only if it is sealed tightly enough, or too large to overturn, is it spared. Their ravenous appetites, their urge to store up extra staples, and their outright gall turns every picnic table into a battleground, squirrel against camper, squirrel against squirrel. Frantic chases and loud protests from all participants continue until the last crumb is consumed by someone or secured out of reach.

When not raiding campsites, trashcans, dumps, and bird feeders, the Red Squirrel displays more natural but equally interesting feeding habits. Have you ever seen a mushroom hanging up in a tree and wondered how in the world it got there? A Red Squirrel probably put it there; after it is dry he will most likely store it away for later. They even eat species that are poisonous to humans with no apparent harm. They are especially fond of the seeds of the conifers in which they live; the cones are usually harvested before the seeds are ripe and ready to fall out. Hidden away in moist underground caches, the seeds remain in the cones until the Boomer is ready to eat them, sometimes as long as two years later. There are usually one or two main food caches and several smaller ones. Some are underground, some in hollow cavities of trees. In places these storage sites are quite large, occasionally attaining a diameter of 15 to 18 feet.

Other foods include acorns, beechnuts, and the mast of silver bell, maple, and buckeye trees, the buds of which form a considerable portion of their diet in the spring. Berries, insects, bird eggs, and some young of birds and mammals are also eaten. Sometimes when feeding at lower elevations in winter, they will feast on black walnuts, their faces and paws becoming stained with the dark juices in the hulls of the nuts. They will also take cultivated fruits and have been known to cause extensive damage to suburban orchards and gardens. There is one record of a single Red Squirrel cutting 250 green apples out of one tree near Highlands, North Carolina.

Boomers construct several different types of nests. The most commonly seen is made of a loose mass of leaves, twigs, and other debris high up in a tree. This nest is used mostly in times of mild weather; during cold spells they usually retire to a compact nest of twigs, leaves, shredded bark, lichens, and mosses that is secured among the densest foliage of an evergreen tree. Holes in tree trunks are also used for shelter; the squirrels do not make these, although they often enlarge the openings of cavities excavated by woodpeckers. They will also build nests in the shelter of out buildings and attics. Sometimes they make burrows under and around stones and stumps; these are used chiefly for food storage. Each individual typically has several nests scattered throughout its territory.

During inclement weather Red Squirrels may remain in their nests for several days at a time, but they do not actually hibernate. Occasionally they may be seen out searching for food on the most desolate of winter days. Normally solitary, Boomers become more sociable during late winter and early spring—their principal breeding period. After a gestation of five to six weeks, a litter of four to six young is born. Naked and blind at birth, they develop rapidly and are weaned when less than five weeks old. Often there is a second litter in the fall. These squirrels have been known to reach the age of at least nine years.

Even though Red Squirrels are not economically valuable, and even though they frequently make a nuisance of themselves in areas inhabited by man, they lend a charm to the woodlands of our western counties. Active and vociferous, the Boomer is so commonly encountered that he is perhaps one of the best known members of North Carolina's extensive mountain fauna.

Is The U. S. Forest Service Doing Something Right? THE UWHARRIE NATIONAL FOREST

by Howard S. Muse, Jr.

PHOTOS BY THE AUTHOR

THE U.S. Forest Service has been having a rough time of it in recent years, what with environmentalists hauling it into court for careless and excessive clear-cutting on the national forests and for failing to preserve the remaining unprotected, roadless wilderness areas on the national forests. If one reads through conservation publications you will come across statements like: "The Forest Service's concern for the environment is almost entirely on paper." Or, "The United States Forest Service, of the Department of Agriculture, is trying to scuttle the Wilderness Act."

In a suit involving the Mononogahela National Forest in West Virginia that was brought by a coalition of environmental groups the U.S. 4th Circuit Court of Appeals in Richmond, Virginia, ruled in August that the 1897 Organic Act establishing the U.S. Forest Service bans timber cutting except when trees are "dead, mature, or of large growth" and are individually marked for cutting, thus prohibiting clear-cutting (see page 22, March 1976 "Wildlife"). While deciding whether to appeal the decision or ask Congress to rewrite the 1897 law, the Forest Service has suspended further timber sales from 9 national forests in West Virginia, Virginia, North Carolina and South Carolina.

In this age of cynicism it almost makes one want to look around for a national forest where the U.S. Forest Service is doing something right in order to renew our faith in the Federal government's stewardship of the public lands.

North Carolina's Uwharrie National Forest could very well be such a place. It does not fit the stereotype of a national forest—mist shrouded western mountains clothed with towering old-growth Douglas fir and spruce. Instead, it's a second-growth pine and hardwood forest framing low hills and rolling uplands in Montgomery, Randolph, and Davidson counties. It's rather small as national forests go (some 45,000 acres), and it has not been a national forest for very long (President Kennedy proclaimed it a national forest in 1961), but it's a national forest nonetheless.

Whatever the Uwharrie National Forest is or isn't, it undeniably presents the visitor with an attractive forestscape, especially the stands that crowd the gravel

roads of the Badin Lakes section. "We have a lot of people who just like to ride through the forest," says Robert M. Carey, 39, for 5 years the Uwharrie's District Ranger and a 15-year veteran of the U.S. Forest Service.

Like so many worthwhile conservation projects, the Uwharrie National Forest had its inception during the New Deal when the Federal Government established the Uharie (Later Uwharrie) Purchase District in North Carolina's south central Piedmont area in 1934 with a gross acreage of 360,000. Land acquisition proceeded slowly at first because the government could buy more land elsewhere for the same amount of money. By the time the Uwharrie became a national forest in 1961, its then 43,391 acres had been acquired for $247,683, an average of $5.71 an acre.

Now, with land prices high and land acquisition funds tight, the Uwharrie will doubtless always be an unfinished national forest. But with the Forest Service's management of our national forests being called into question at every turn, it's appropriate to ask how the Uwharrie is being managed. In particular, how does its management conform to the Multiple Use-Sustained Yield Act of 1960, the basis for much of the Forest Service's management of the national forests?

By multiple use, the Act not only means managing the national forests for timber production, but for watershed protection, wildlife, and recreation. By sustained yield, the Forest Services is supposed to cut no more timber than is grown each year or period of years. How does the Uwharrie stack up when measured against these objectives?

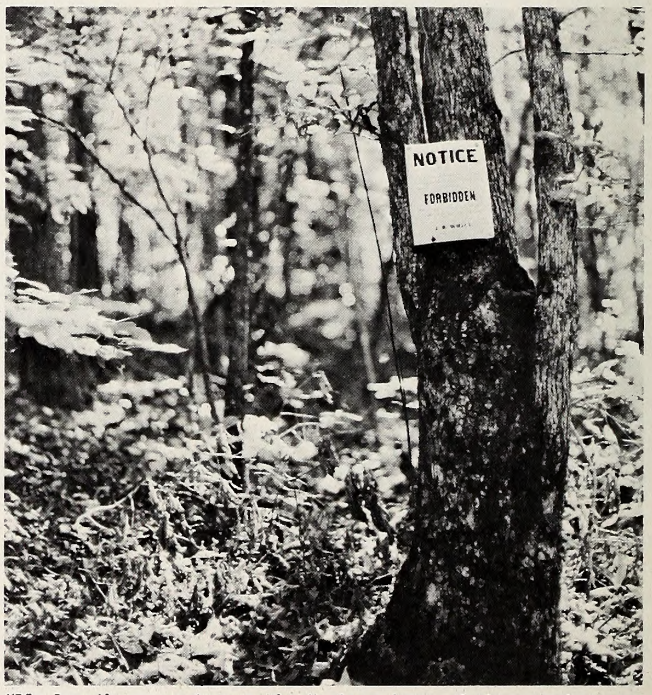
From all appearances, the multiple use concept is alive and well on the Uwharrie. The most important recreational activity on the forest is hunting, with deer, duck, woodcock, quail, dove, rabbit, racoon, and squirrel available. With only 4% of North Carolina's national forest land, the Uwharrie receives 23% of the national forest hunting use, according to Carey, who hunts himself. "This is the best known deer hunting area. We're trying to spread the hunters out, but this section has always been known as a deer hunting area," he says of the Badin Lake section during a tour of the forest. On the opening day of the deer hunting season as many as 2,000 hunters converge on this 9,000 acre block. Despite the heavy hunting pressure, the deer are still there, for "Hunting in North Carolina," a booklet published by the North Carolina Wildlife Resources Commission, shows the Uwharrie as having a "High deer population, well-established herd at upper limits of range capacity."

Many of the Uwharrie's tracts, however, are small and landlocked, lack public access, and with "No Trespassing" and "No Hunting" signs plastered over much of the intervening private land, they are unavailable for public hunting. "AMAZON HUNT CLUB" is the signature on one row of no trespassing signs. It makes one wonder if brawny women carrying rifles and shotguns will be stalking these woods during the hunting season.

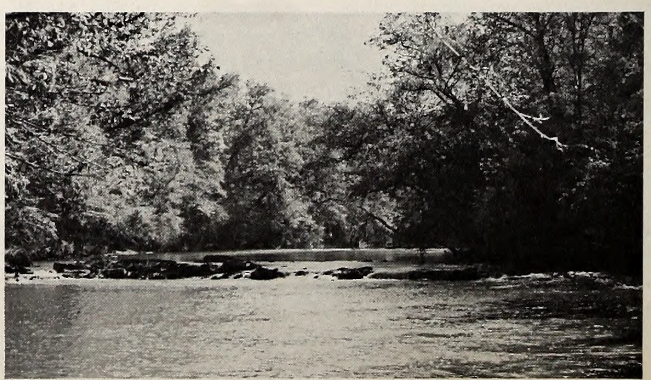
While the primary concern of wildlife management on the Uwharrie is the enhancement of the hunting experience, the bird watcher and other nonconsuming user is free to wander its woodlands. Three red-cockaded woodpecker (an endangered species) colonies in mature shortleaf pine stands have been protected. Other stands have been surveyed to see if the bird is present before they have been harvested.

"It's up all the time, especially backpacking and hiking from the surrounding cities," states Carey of two of the Uwharrie's other recreational activities. The 20-mile Uwharrie Trail winds through the forest. "It's almost as nice as the mountains and a lot less crowded," says David Dawson of Whispering Pines, NC, who camped in the forest recently. As a national forest within easy driving distance of the Piedmont's cities recreational use of the Uwharrie should increase even more in the future. One recreational use that disturbs Carey is the abuse of forest trails by motorcycles and trail bikes. One eroding trail seems to lead straight up one of the Uwharrie's mountains.

Despite the increased activity, recreation is underfunded on the Uwharrie, with only $2,501 specifically earmarked for it the past year. "Last year it was $2,500. They were real nice and gave us a $1 increase," muses Carey. He has, however, been able to supplement these funds with work done this summer by 26 youngsters from the Youth Conservation Corps. The 15 to 18-year olds worked for 8 weeks doing such tasks as picking up litter, painting trail markers, setting out bird houses, making wildlife surveys, and clearing brush. Twenty percent of their time was allocated to environmental education. "Most of these kids are into the environment," adds Carey.



"No hunting—no trespassing" signs issue their warnings on private land adjacent to the National Forest. The area generally has good deer hunting. The Uwharrie River (below) flows through the Forest and offers some good fishing, particularly in the spring for white bass.



As for watershed protection, the Forest Service has made it a policy on the Uwharrie to leave stringers of trees along waterways to prevent erosion and siltation. 1,031 acres have been set aside as a travel and water influence zone to protect scenic and watershed values in sensitive areas, such as those in the Badin Lake and Uwharrie River areas.

Since 1962, when the Forest Service first introduced clearcutting, or "even-age management," a euphemism that the Service uses, on the Uwharrie, more than 7,000 acres have been clearcut and regenerated. All this clearcutting has not alarmed Carey: "It's hard for a lot of people to realize that you are growing another crop of trees and not destroying the resource. It doesn't look bad to me when I see the young seedlings coming through." Since the beginning of the energy crisis, this timber cutting has had a beneficial side effect: the Forest Service has let local residents salvage tops and snags for firewood.

Still, one might ask, is clearcutting really necessary on the Uwharrie, or on any other national forest for that matter? The Forest Service thinks it is, and has printed colorful booklets stating the case for clearcutting. Carey points out that as a result of poor timber management before the Federal Government acquired the land, much of it was in rundown farm woodlots, the Uwharrie had an overabundance of understocked, poor quality stands. It is this land that has been cut first and regenerated. And, pine, as a professional forester will tell you, is a pioneer species, requiring full sunlight for the seedlings to grow.

Regeneration is no problem on this clearcut land. "We get pretty good stands. We very seldom have a planting failure on this land with a halfway wet spring and decent care of the seedlings. They come through pretty good," explains Carey. "It doesn't take this land long to get a good ground cover, so you're not going to get much erosion on this land," he adds. One can readily see that on much nearby private land, clearcutting has not been followed by replanting.

Robert Carey, Uwharrie District Ranger, inspects a young pine plantation. "It doesn't take this land long to get a good ground cover . . .", he says. Clearcutting on nearby private land often isn't replanted, however.

To lessen the visual and environmental impact of clearcutting on the Uwharrie the Forest Service keeps them scattered and has placed a 100-acre limit on clearcuts in pine stands (most average about 50 acres), and 50 acres in hardwood stands. Every resources management decision must be accompanied by an EAR: Environmental Analysis Report. "We have plenty of red tape, but it's all aimed at better management," admits Carey. "We try to do a good job."

During a tour of the Uwharrie, it becomes evident that timber production and wildlife management are not mutually exclusive. Logging, for example, produces underbrush, and this is what deer live on. The Forest Service seeds logging roads with wildlife mixtures and plants small fields with millet and other grains to attract wildlife. Just how effective the latter practice is was demonstrated at one field when several dozen doves took off at our approach. Carey stops at several clearcuts that have been replanted to loblolly pine. Because of the wide spacing (7 x 14 feet, 450 seedlings an acre)there is ample room in these young stands for hardwood sprouts, like persimmon and wild cherry, that make good wildlife food.

Several of the young plantation, in fact, hardly qualify for the label "pine monoculture," so profuse is the hardwood regeneration, especially oak and yellow poplar. Overall, the Forest Service has classified the Uwharrie as consisting of 31,530 acres of pines and 12,478 acres of hardwoods, although there is considerable overlapping of the tree types in the actual stands. Rather than the 25-35 year rotations used by the forest industry, the Forest Service has adopted 70 years for loblolly pine and 80 years for hardwoods as the rotation ages for the Uwharrie, sufficient time to allow multiple uses for which the Forest is intended.

"We grow a lot more timber than we cut," is Carey's response to the question of whether or not the Uwharrie is being managed according to the sustained yield principle. Specifically, its new 10-year management plan calls for the Uwharrie to grow about 16 million board feet of timber a year and cut 4 million board feet, surely a healthy surplus of growth over cut and in line with the yearly surplus on North Carolina's national forests: Pisgah and Nantahala in the mountains and Croatan on the coast. The latest North Carolina forest surveys show that growth exceeds cut by a wider margin (about 4 to 1) on the national forests than on other ownership classes statewide, including the forest industry.

It helps, of course, that in managing the Uwharrie's timber resources that in place of heavy pressure from industry giants and trade associations clamoring to cut the remaining old-growth timber on the national forests of the Pacific Northwest, the Uwharrie's foresters have to deal with such relatively small local firms like Jordan Lumber of Mt. Gilead, Troy Timber Sales of Troy, and Southern Woodyards of Biscoe, none of which are dependent on the Uwharrie to meet their raw material needs.

Lastly, what about wilderness preservation on the Uwharrie? Simply stated, this problem does not exist, for as a second growth forest, it has no areas that qualify for preservation under the Wilderness Act of 1964.

So, except for a true wilderness experience, there is something for every visitor to the Uwharrie, whether you are hunter, fisherman, bird watcher, camper, or someone who just likes to admire the scenery.

Turtles of the Coastal Plain

by Kenneth T. Nemuras
Photos by the Author

THE large and wary turtles that bask auspiciously along many of North Carolina's inland waterways—and disappear with a sudden splash at the slightest disturbance—have been tagged with an array of descriptive and sometimes colorful names. Commonly, they might be called pond turtles and sliders, river cooters, red-bellied and yellow-bellied turtles, painted turtles or a host of other appellations. Scientifically, many of them belong to a group of turtles known as *Chrysemys,* meaning "golden turtle" in its native Latin.

When you consider the fact that turtles in general have been around for well over 150 million years and that the early cotylosaurs—which are the possible forerunners of chelonians and other reptiles—existed more than 250 million years ago, then the *Chrysemys* by comparison are a relatively modern group of turtles. These and many of the other forms that are living now (some exceptions are softshell turtles and most sea turtles) evolved at various times during the Tertiary Period.

Throughout much of eastern North Carolina, the shallow inlets, ponds and quiet coves that are so abundant provide a placid setting for the Coastal Plain's various fresh-water inhabitants. Turtles, as they occupy partially submerged logs, protruding branches and occasionally the gentle-swaying pads of flamboyant water lilies, display a fondness for basking in the sun's warmth that is perhaps unequaled among other reptiles.

Many years ago as a youngster, I was often fascinated by the big yet unobtrusive-looking turtles that would ponderously assemble on any warm summer morning, and I never tired of roaming wooded shorelines or familiar waterways for an invasive glimpse of these domed reptiles. Much of my boyish instinct to chase haphazardly after a fleeing turtle has long since diminished, but from time to time I may still find myself armed with a camera and quietly pursuing a cautious chelonian as it bathes in the sun.

Most of the larger and more leary individuals normally maintain a respectable distance from land, though in late May or June the female turtles slip ashore and, often unnoticed, laboriously construct their nests in the sandy or loamy soil, deposit and conceal a number of white, brittle-shelled eggs, and then return expeditiously to their watery refuge. I once watched a River Cooter, *Chrysemys concinna concinna,* complete this task not far from the banks of the Alligator River in Tyrrell County, leaving behind a neatly-packed contingent of nearly a dozen eggs. The young turtles, when they hatch, are greenish-hued above and blend in perfectly with the aquatic vegetation; as the turtles age, the coloration will gradually darken.

When they are not piled conspicuously on logs or other protruding objects, you might catch sight of one

These are newly hatched Spotted Turtles. This species prefers the marshy meadows and bog ponds of the Coastal Plains. Adults often acquire a heavy sprinkling of the light yellow spots. It may be confused with the rare Bog Turtle, which has a large orange head patch.

The Red-bellied Turtle (above) is a fairly large basking turtle, often seen sunning itself in southern Coastal Plains ponds. It is usually much larger than the Painted Turtle with which it shares its habitat. The yellow or orange head stripes of the Eastern Mud Turtle (below) are irregular, and the shell is a dark brown, or olive. It has a strong tolerance to brackish water and often frequents tidal marshes.

This young Box Turtle (above) will develop a much more "dome-like" shell and the color patterns will vary considerably. Below is the characteristic red and black underside of the Red-bellied Turtle. The Softshell Turtle (lower) has a long snout and a leather-like, pliable shell.

of the Coastal Plain's various turtles darting across the bottom of a shallow cove or feeding leisurely on the aquatic plant life that may flourish along the water's edge. One of North Carolina's more agile forms is the almost ornamental-looking Painted Turtle, *Chrysemys picta picta*. Usually this decorative species (black with yellow and red markings) is not easily approached, although careless turtles may sometimes become so engrossed in their sunning or feeding habits that they are unaware of casual intruders.

On one occasion, as I stood undetected on a fallen log, a courting pair of these turtles went gracefully about their ritual in the clear water below me. The male, in typical fashion, would pursue and continuously confront hs intended mate, then gently stroke her head and neck with his characteristically long foreclaws. Each time that his advances were rebuffed by the alluring female, he would once again repeat his affectionate behavior. During certain times of the year the miniature hatchlings of this species, as well as other *Chrysemys*, are often discovered hiding beneath lily pads or entangled in the aquatic moss that blankets many shallow bodies of water.

Other gregarious Coastal Plain species include the Florida Cooter (*Chrysemys floridana floridana*), which ranges into North Carolina from the south, and the Red-Bellied and Yellow-Bellied Turtles (*Chrysemys rubriventris rubriventris* and *Chrysemys scripta scripta*). The latter two turtles are appropriately named, as their brightly colored bottoms are the most prominent clue to their identities. At one time the somewhat larger red-bellied turtle was hunted as a commercial food item, and even today it is still trapped (along with other edible "cooters") in some areas.

Not all of the turtles that inhabit the Coastal Plain, of course, belong to the genus *Chrysemys*. The formidable-looking Snapping Turtle, *Chelydra serpentina serpentina*, commonly lurks in quiet waters, as does the smaller Mud Turtle, *Kinosternon subrubrum subrubrum*. The much more attractive Spotted Turtle, *Clemmys guttata*, is sometimes encountered in swamplands or along slow-moving streams, while the Diamond-Backed Terrapins (*Malaclemys terrapin terrapin* and *Malaclemys terrapin centrata*) are citizens of brackish estuaries. Softshell Turtles (genus *Trionyx*) occur across much of the United States, including the southern Coastal Plain, but because of their aquatic habits they may often go undetected.

More conspicuous is the long-necked Chicken Turtle (*Deirochelys reticularia*), though it too is a form that is more prevalent further south. And, almost anyone who has roamed through the woods after a summer shower is familiar with the land-dwelling Box Turtle, *Terrapene carolina carolina*.

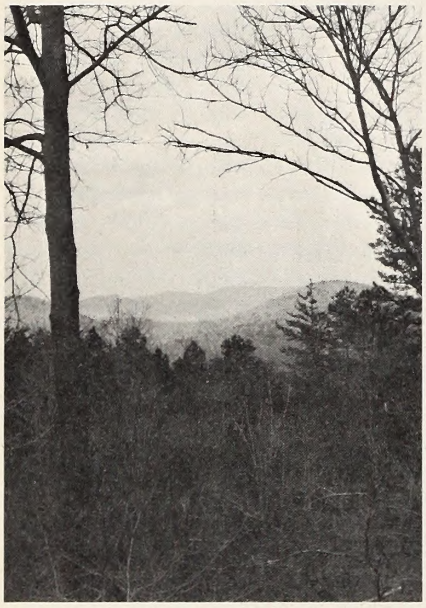
If a little turtle appears at the end of your fishing line "disguised" as an unusually strong sunfish, it may very well be the Musk Turtle, *Strenotherus odoratus*. The "stinkpot," as it is often called, can be somewhat of a nuisance at times, and it does not hesitate to attack both baited hooks and careless fingers with the same aggressiveness. There was an instance once when I piled a number of these turtles into my cupped hands after I had found quite a few of them crawling in shallow water along the edge of a narrow causeway. A sudden and vicious bite on my finger by one mischievous little individual sent the entire assemblage flying through the air—which must have looked like a rainstorm of turtles to any bewildered passerby!

Naturally, the armor-like shell that turtles are endowed with provides considerable protection from both their predaceous enemies and the occasional rough handling they might sometimes receive. It is perhaps this feature that has allowed them to survive down through the ages while many other reptile orders have become extinct. The turtles that are around today, as they aggregate on logs or prowl in various waterways, are an interesting and integral part of our wildlife and we are fortunate that a generous number of them make the Coastal Plain their home.

THE UWHARRIE TRAIL

by Mike Chisholm

PHOTOS BY THE AUTHOR



The Uwharrie Mountains are among the oldest ranges in the Western Hemisphere. They are the remnants of the ancient Ocoee Mountains created 500 million years ago. Scientists estimate they probably were over 20,000 feet high, but today they seldom exceed 1000 feet in elevation; they are nonetheless rugged and picturesque.

The Uwharries cover a large portion of the lower and middle Piedmont including Randolph, Montgomery, Richmond, Stanly, Rowan and Davidson counties. Isolated knobs, long ridges, and rounded hills are thickly timbered and coursed by fast flowing rocky streams shrouded in mountain laurel. Wildlife among these hills of the larger species include deer, bobcat, raccoon, fox, turkey, etc.

Along the general crest of the Uwharries a trail is being pioneered. It passes many interesting attractions such as abandoned graves and homesteads, and gold mines. The trail crosses both public and private lands. Therefore, hikers are asked not to abuse this privilege by any form of misconduct.

Eventually the completed trail will cover approximately sixty miles stretching from near Lake Tillery in Montgomery County to near the Asheboro Municipal Airport in Randolph County. There also will be a network of side trails to various sites of interest along the main trail.

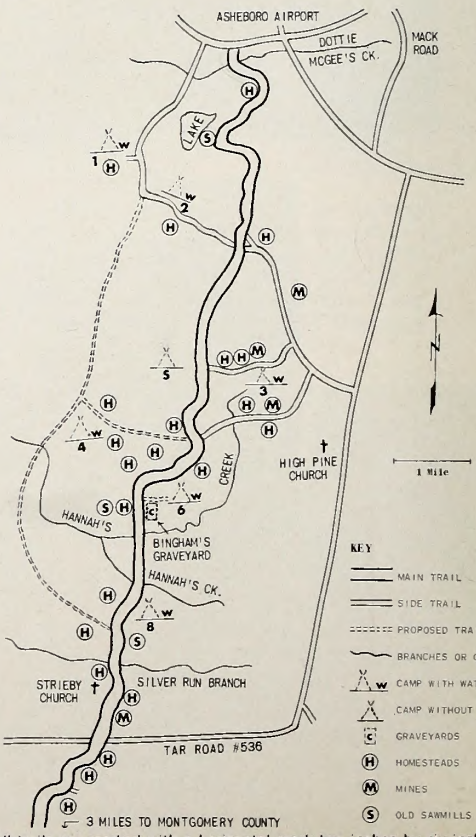
Much credit in the trail building effort goes to Joe Moffitt and his Scout Troop 570 of Asheboro. Also assisting are members of the Greater Uwharrie Mountain Preservation and Appreciation Committee (GUMPAC), other scouts from Montgomery and Randolph counties, and youths employed with the National Forest Service. Appreciation should particularly be given to Bob Carey and the other rangers of Uwharrie National Forest for their cooperation.

Joe Moffitt, mentioned previously, also a member of GUMPAC is compiling information for a trail guide to this area. This book will contain the history and location of interesting sites along with maps of the trail. The book will also contain ghost stories, wood crafts, and various wild herbs found in the Uwharries.

The trail is marked by white paint blazes on trees and rocks as it follows old wagon and sawmill roads for many miles. The side trails will be blazed with different colors of paint. A lot of work using bush axes and machetes is required in finishing the trail. Campsites with fire pits and water springs will be available along the trail. Wood is plentiful for building fires but with caution in the dry seasons. The climate of the area is mild winters with warm and humid summers. Hikers should be alert for poisonous snakes during the warmer months, even though they are seldom seen on the trail.

If you are tired of overcrowded campsites, congested trails, and overnight permits—try the Uwharrie Trail. It is seldom used now but is sure to be used more by hikers once the beauty and remoteness is discovered.

Joe Moffitt and his Boy Scout Troop 570, deserve much of the credit for developing this trail (above left). The map below shows the Randolph County section of the Uwharrie Trail. (It is not recommended for inexperienced hikers without a guide).



All trails are marked with a horizontal mark two inches by six inches. The main trail is marked with white paint. All side trails are marked with green paint. Two marks on the same tree (one over the other) means CAUTION—change in trail or place of interest.

At Home With The Carolina Wren

By Dwight L. Peterson
Photos by the Author

It was about mid-March, 1975, when I first saw the nest. It was not yet complete but the characteristic dome shape with a side entrance told me it was a wren construction. Probably a Carolina wren. Many wrens favor old buildings for their unique nest structures so it wasn't unusual that I found this one in our old storehouse. Since the wren does not migrate I couldn't help but wonder if the ancestors of this wren might have been around when the old storehouse was young. The storehouse itself dated back to the early 1900's and the wren had picked a typical spot for its nest.

An apple box had been lined with brown paper in years past and nailed to the wall to serve as a rude cabinet. This nest was symbolic of the Carolina wren and there was little doubt in my mind about identification of species without seeing it. Nest shape, design and location were the most identifying factors. Nesting material conformed to the Carolina but to many other birds as well. Twigs, grass and other type straw, dead leaves, and fabric. The Carolina wren is really not choosey about nesting material and usually uses what is convenient and fits into their scheme of construction. Later, while preparing to photograph the nesting activity, I spotted the builders. They were Carolinas.

The Carolina wren is, according to nature reference sources, the largest wren of the east with the Florida wren being close to the same size. *Audubon Nature Encyclopedia* gives the cactus wren as being the largest in the wren group and is a resident of the deserts along the Mexican border. The same reference states that the Carolina wren seldom occurs west of the 100 degree meridian.

The white eye stripe is a conspicuous mark of the Carolina wren. The sexes are colored alike. It is an attractive bird being reddish or cinnamon brown above and buffy below. The chin is white and there are very narrow black barrings on the wings and tail. Length is 5½ to 6 inches. It is very seldom still long enough for good observation and twitches its body about in nervous movement. Many wrens, like the house wren, have the habit of cocking the tails over their backs. This isn't so much a characteristic of the Carolina.

The voice is musical and has certain variations. Putting the notes into word form is difficult. From the dozens of nature references I consulted, I would more closely agree with Clement S. Brimley, Herbert H. Brimley and Thomas G. Pearson in the book, *Birds of North Carolina* (out of print). They identify the voice as, *"Jo-reeper, jo-reeper, jo-ree."* Another variation, *"freedom, freedom, freedom."* This seems to fit my own observation very well. There is one agreement among most nature references and that is, the voice is *loud* and *clear*. It has been my experience that you will wonder how so much volume can come from such a small being. The final vocal identification would be the alarm. I would sum this into two words, a *buzzing chatter*.

The nest of the Carolina's I was observing was complete when I finished preparation for photographs. The female had passed her approval and checked the nest completely, inside and out. By March 31 four eggs had been deposited in the nest (egg number for the Carolina is 4-8). The length was less than one inch, about eight-tenths of an inch to be more exact. They were creamy white and spotted with brownish blotches. The blotches changed somewhat on the larger end of the egg and appeared close to a lavender color.

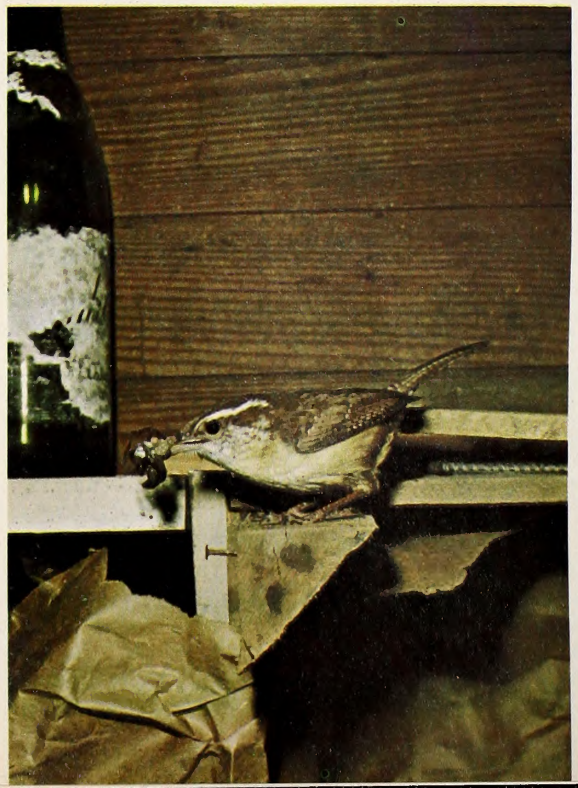
During incubation the female occasionally left the nest in search of food but soon returned. The male supplied most of the food she ate and was a faithful sentinel when not attending to other duties. It was really very interesting to watch his actions. When incubation began he ventured only close enough to poke food to the female. This was done from a distance great enough that he had to stretch his neck to reach her outstretched beak. He more or less continued this pattern of behavior when helping feed the young. During this time, however, he did venture closer at times. But never as close as the female. Throughout the nesting activity it was fairly easy to distinguish the male from female by actions and behavior.

Another behavior pattern was the approach to the nest. The female entered the building and flew straight to the nest. The male was cautious. He entered the building, checked the surroundings, flew to the top of the apple box, and satisfied himself that all was well. He then approached the nest by dropping to the bottom of the box and kept turning himself checking all directions. It was during one of his approaches when I accidentally dropped a camera shutter release cable. He had a cricket in his mouth. As fate would have it, he dropped the cricket a moment before I dropped the cable. Dropping the cable had nothing to do with his dropping the cricket, but he had to blame something. He attacked the blind from which the noise came. It's hard to believe the fury bound into such a small amount of feathers. After cooling his temper by clawing and pecking the canvas blind from top to bottom, he left the building for another insect. The cricket he had dropped remained on the floor even after nesting activity had ended, days later.

By April 11 all four eggs had hatched. Afterward, the female was seldom away from the nest more than five minutes. Actually, she remained in the nest much of the time with the young. Especially during low air temperature periods. This was a habit that continued until the nest was so full of birds she could not enter. During these early stages of activity, the male continued to supply most of the food. It was passed to the female and she either ate it or chose which of

At Home with the Carolina Wren

The young wrens always seemed hungry, and feeding was a never-ending process. Both parents shared this all day task until the young birds left the nest.



Insects, both the adult forms and various larval stages, seemed the preferred food items. The male apparently fed the female while she was incubating the eggs. When it was time to leave the nest, the last young wren (below) almost refused to leave the building. He perched on top of the author's blind while the parent scolded and coaxed.

The female inspected the completed nest thoroughly before she began the egg-laying. Caution seemed the byword throughout the nesting and young rearing.

By March 31, four eggs had been deposited and this constituted the clutch for this nest. Although the female depended on the male to bring her food during the incubation, she left for short periods.

the young needed it.

Soon after hatching, the female began nest cleaning. Some of the egg shell remains were carried off by the female. Some of the remains were passed out to the male which he carried off. I could not record on film the actions of the female deep inside the nest cavity. But she appeared to be eating much of the egg shell remains. This was a highlight of the nesting activity. I regret that I could not capture it on film. There was no evidence that the male followed the same habit.

It was interesting to note, during my observation of the Carolina wren, the absence of information in nature references. This included encyclopedias. Nowhere could I find notations concerning the habit of shell eating by the female. Maybe there are writings, somewhere, that I failed to find. I'm sure many birds must follow the same procedure. I also failed to find notations concerning the waste disposal of the young. Actually, the entire nesting activity includes the necessity of cleanliness. The digested food was regurgitated and was taken from the mouths of the young by the parents. It was in a form similar to a small wad of chewing gum and varied in color according to what had been eaten. This was carried away from the nest and disposed of. To me, all this just goes to prove you can't beat observing the real thing to acquire proper insight.

The young grew rapidly. Insects were the entire diet throughout the nesting activity. At first, with the exception of the small amount of food regurgitated by the parents for a very short period, the young were fed almost entirely on "worms" and the larva stage of insects. As the young grew, some forms of insect food had reached pupa stage but all was soft. As the young continued to mature, the adult stage of insects became more popular as food choice. Crickets presented the largest percentage of food choice with grasshoppers running a close second. Larvae appeared to consist mostly of Japanese beetle and similar forms. On an average, trips to the nest with food were about every ten minutes. However, the brood of four should be considered here. A larger number of the brood would have probably required more trips. Anyway, it isn't hard to imagine the large number of devoured insects.

During feeding there was one of the young that always seemed hungry. He kept shoving for a front position. But beyond this the young seemed to have a feeding pattern. If the one in front was fed he moved to his left, counterclockwise, and the next to his right fell into front position. This wasn't so much a necessity when the female brought food. She checked mouths to find which of the young needed the goody. But the front position paid off when the male brought food. He poked it up and didn't bother with selection. Seemingly, to him, it was a survival of the fittest.

The parents often made a clucking sound when they returned with food, but this wasn't always necessary to alert the young. They soon learned the buzzing flutter of the parent's wings when they entered the building. When this sound was heard, mouths gapped open as if equipped with automatic hinges.

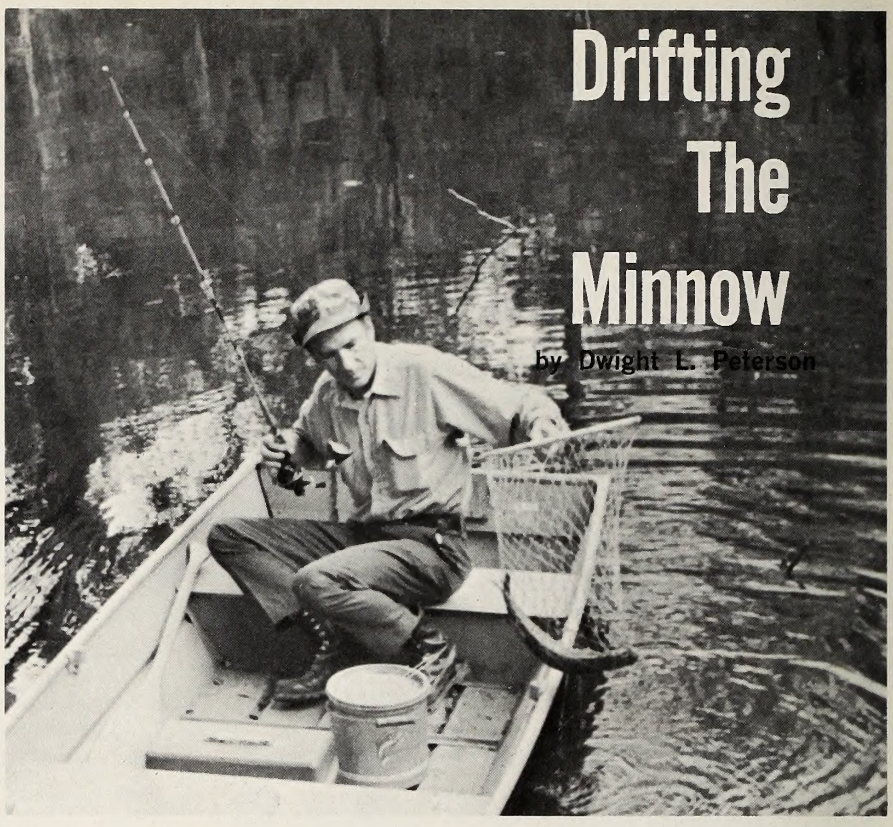
It was April 23 when I heard the young make their first wren type sounds. Up until this time sounds from the young were chirping noises, much like that of any small bird. They now resembled the parents and all features were almost complete in development.

April 27, about 9:00 AM, the parents decided it was time for the young to evacuate the nest. A crack over the front door of the building, which the parents had been using for passage, was selected as the exit. It was quite a chore and I have never heard such a chattering racket from such small birds. With the parents setting the example, the first three followed suit without much difficulty. After the first little one made it out, one of the parents stayed outside and the other worked inside. It took a full 15 minutes to get the last little one through the crack and I wondered if he might be the one always first in the food line.

The last I saw of the family was on a low limb of a hickory tree not far from the building. They seemed very proud of their victory, and looked as typical to their North Carolina environment as the mockingbird. Indeed they should have. ◆

Drifting The Minnow

by Dwight L. Peterson



PHOTOS BY THE AUTHOR

The author nets a two and a half pound pickerel taken with the minnow drifting method. This technique covers more water than ordinary "still fishing," and usually is more productive.

I had pulled my 12 foot jonboat up on a sandbar, about two miles upstream from the landing, and began thinking in terms of the dozen live minnows I had kicking up water bubbles in my minnow bucket. In live minnow fishing, choice spots in rivers and creeks seem to be the quiet, deep holes found in the bends. It isn't unusual for the fisherman to spend an entire day sitting on the bank watching his cork bobble and not leave the particular hole he is fishing. But, as I found out, there is a better way: more work, but faster action.

Fish can be as unpredictable with their whereabouts as they are with their feeding urges. I am fond of drift fishing using spinners, plugs, flies and popping bugs. Recalling from these past experiences, I know fish can be completely out of expected habitat, at times. The jack (chain pickerel), which I had foremost in mind for this trip, is most often found in quiet water. I don't argue this point because it's true. But I have had him knock the flash out of a spinner or the paint off a plug in swift water, too.

With these thoughts in mind, why should I *still* fish the minnow? Why not use the current of the stream and drift the minnow in *front* of me? By doing this I could fish practically all the best areas by letting the minnow drift through them. It seemed worth a try.

I had barely drifted a 100 feet when my minnow caught against an underwater snag. I changed my fishing depth from three feet to two.

The two-foot depth worked much better and I, and the minnow, drifted slowly through a fairly deep hole in one of the creek bends. It was a fishy looking hole, one of those where you feel you should hide to bait your hook. When the minnow reached the lower end, I guided him through a narrow channel that ran parallel with the right bank. Suddenly, the cork was gone. I waited a few seconds and then went back hard on the rod. He was on. After the fish was netted, he stretched my hand scales down to the two and one half pound mark. A nice jack that counted number one on my stringer.

There were misses but when I reached the landing I had arrived at some definite conclusions. It was a sure thing the action was much faster with this method of live minnow fishing. The credit, I felt, was due to the amount of good fishable water covered by drifting. I had four jacks and one largemouth on my stringer. One minnow was left in my bucket. Another short drift below the landing seemed logical. That last minnow lured a jack that went a fraction over five pounds—a nice way to end a trip.

I have used the drifting minnow method many times since that first trip several years ago, and have seldom failed to bring home fish. But I might mention—and this may not appeal to you—this method is better done alone. I'm not saying it cannot be done with the buddy system, but in this case one brain is better than two.

Assuming you are right handed, you will be fishing and controlling the minnow with the right hand. Most of the time you will be using the paddle to control the boat and you will be using the left hand for this. Let your eyes continually search the water ahead and plan

Many North Carolina streams, particularly the slow-moving Coastal Plain rivers, are readily adaptable to this angling method. The boat should be light-weight yet stable; don't take chances.

your moves in advance. It is a different type fishing than drift fishing with a buddy and casting. You must control the boat to suit the drift of the minnow. A buddy cannot predict all your planned moves. There will be times you will want to stop, slow down, speed up, move more to the left or to the right. It will be best if you decide and carry out these moves.

Use a paddle at least five feet in length. I don't recommend the sculling length paddle because of shortness. There will be times you will be gigging bottom for boat control. In streams where there are snags, logs and lodged brush, you can use these to your advantage by holding on to them to stop the boat, or pushing it here and there. Even low hanging limbs that can be reached while sitting in the boat can be used in maneuvering.

A medium weight, six to seven foot spinning rod works best for me. Either a freshwater spinning or spincast reel is fine, but I prefer the open-face spinning reel. The line seems to fall freer from the spool and you can control the line with finger pressure against the spool rim. Of course, the button or lever release on the spincast reels can be used for the same control. It will be best to leave the reel in the line release position, the bail open on spinning reels, until you must retrieve the minnow or set the hook after a strike.

Experience will be your best teacher but I might add this: I prefer bobbers of the regular cork material and color. Bright colored bobbers are all right during autumn months and other times when leaves or other material will be floating on the water. The important point to remember here is that you will be drifting the minnow well in front of you. Maybe 20 to 60 feet. Try to keep the bobber in sight.

Let the minnow and boat move naturally with the current except when maneuvering is necessary. When retrieving, except when fighting a fish, let the line slide through your fingers and apply light pressure. This dries your line to some degree. The line is easier kept in sight, and of best use in controlling the minnow, when all or parts of it are floating.

If you are familiar with live minnow fishing, you probably have your own thoughts about how to hook the fish after a hit. But I have found, with this system, that it's better to set the hook soon after the fish takes the minnow. After a few seconds, slowly take the slack out of the line and then go back hard with the rod.

I don't think you will have much trouble with hangups while fishing at a depth of two feet. But if your minnow does catch on a snag, give him a gentle twitch with a short, quick raise of the rod tip. The gentle shock jolts him into a frenzy of activity. Many times he frees himself. If this fails, slowly reel him toward you. Feeling a solid pull means you should go to him. Take care of your minnow and keep him lively.

With this system you can expect any fish that normally takes a live minnow. Of course, the size of your minnow will be one key to the kind of fish you might catch. But try to keep your minnow continuously in the water. Even when water is fairly shallow the entire width of the stream, there is usually a gut of deeper water on one side or the other. Fish it. ▲▼

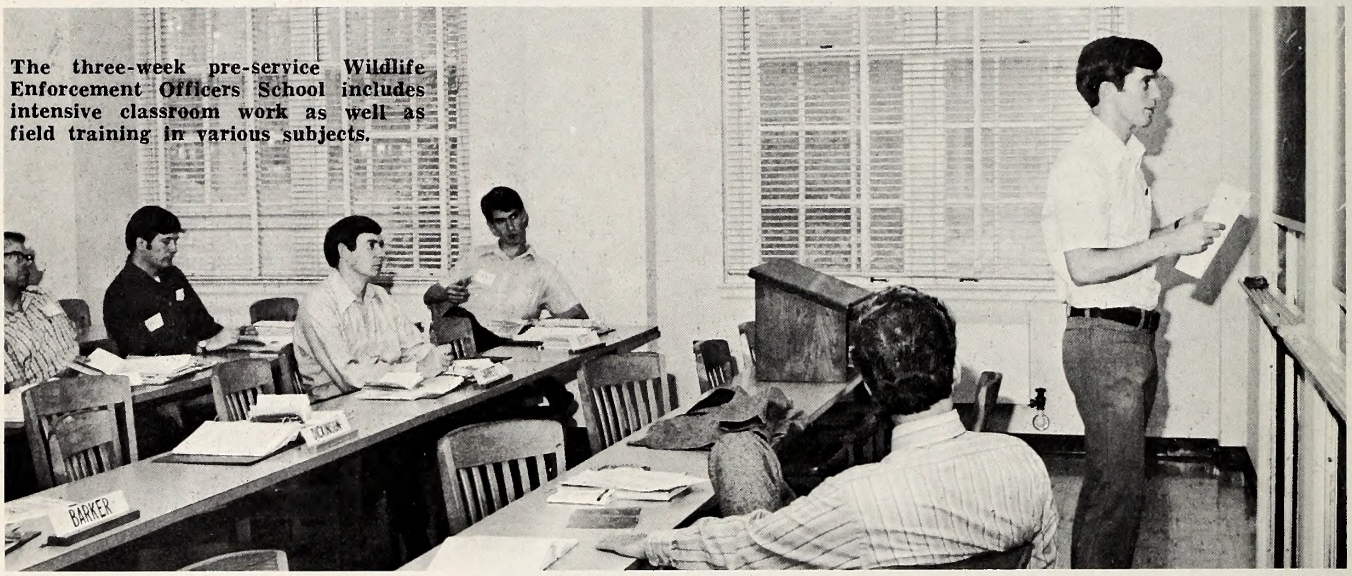
Controlling and "directing" the minnow is very important. Maneuvering the boat is vital, too, but keeping in touch with the drifting minnow makes the difference between a good catch and just another trip. The insert (left) illustrates how the line is controlled with finger against the reel spool. It works, as evidenced by these two fine chain pickerel. The top one went over five pounds.

Eastern North Carolina streams provide some of the most scenic fishing anywhere. Minnow drifting is but one productive method.

Tarheel Wildlife Enforcement Officers have earned a national reputation for the outstanding job they are doing in conservation. This important article tells why and outlines the policy for selecting and training personnel.

How To Become a Wildlife Enforcement Officer

by C. J. Overton, Jr.
Asst. Chief, Enforcement Division



The three-week pre-service Wildlife Enforcement Officers School includes intensive classroom work as well as field training in various subjects.

• Wildlife Enforcement Officers are not just folks who decide they want to be officers and as a result handed green uniforms, revolvers, and other equipment and sent into the woods and on the waters.

The selection process these officers go through before they are employed by the Wildlife Resources Commission is a rigorous set of examinations, both physical and mental, and very competitive. Let's look at some of the reasons behind such training and see why it is so beneficial.

Most industrial and governmental organizations recognize that there are several elements of personnel management which are basic to a successful program. Some of these are: (1) proper selection of persons for employment, (2) proper training prior to or upon entering employment, (3) proper supervision of employees, and (4) a planned program of on-the-job training, either continuously or at regular intervals. These same essentials, of course, apply to a wildlife law enforcement organization. This was recognized shortly after the Wildlife Resources Commission was organized nearly 30 years ago and steps were taken to make these elements a part of its program.

Personnel Selection

Selection of the right person for the job is the first matter of concern. During the past 25 years, the Commission, working with the Institute of Government at the University of North Carolina, has evolved a process of personnel selection which has brought outstanding results. The objective of this process is to select approximately 10 to 20 well-qualified applicants for pre-service training as prospective Wildlife Enforcement Officers each year.

The first step in the selection process is the screening of employment applications which have been received throughout the year. This screening consists of determining whether or not the applicants meet the minimum acceptable standards for employment which have been set by the Commission, the Office of State Personnel and the Criminal Justice Training and Standards Council. We are also looking for applicants who can render 30 years of quality service to the State of North Carolina.

According to the standards set forth, an applicant must be:

(1) At least twenty-one years old.
(2) Between 68 inches and 78 inches in height.
(3) Between 150 and 235 pounds in weight. The height and weight ratio should be reasonable.
(4) A resident of North Carolina for one year.
(5) A citizen of the United States.
(6) A high school graduate or equivalent.
(7) Able to pass a rigid physical examination showing no physical handicap which would interfere with the performance of extreme physical responsibilities.
(8) Of good moral character as evidenced by not

having been convicted for any criminal offense involving moral turpitude.

(9) Of good reputation among his neighbors, high school teachers and other of his associates.

(10) Able to comply with the policies set forth by the Office of State Personnel which prohibit two members of an immediate family being employed at the same time in the same administrative unit.

(11) Willing to take the competitive, mental and written, examinations for entrance to the three-week training school for prospective Wildlife Enforcement Officers.

(12) Willing to accept employment anywhere in the State.

(13) Willing to take instructions from superiors.

(14) Willing to work weekends, nights and holidays whenever activity requires it or when the supervisor orders it.

The Commission also considers many qualities not listed; however, the Wildlife Resources Commission feels that a person has to meet the minimum standard in order to be intially considered for the position of a North Carolina Wildlife Enforcement Officer.

The first thing an interested applicant should do is to secure a standard North Carolina Application for Employment form, complete it and mail it to the Raleigh office of the Division of Wildlife Enforcement where the application will be examined. If the candidates meet the requirements set forth, they will be notified to go to the nearest North Carolina Employment Security Commission office to take the General Aptitude Battery Tests.

Applicants passing the examinations will receive arrest record forms to be completed by the police and/or sheriff's department and a physical examination form which must be completed by a physician of their own choice and at their own expense. All completed forms must be mailed to the Raleigh office of the Commission where they are examined. Applicants meeting the minimum standards are invited to the Institute of Government, Chapel Hill, North Carolina, for a full day of competitive testing which consists of several written examinations, a strength and agility test and oral interviews. Each interview board is staffed by three of our supervisory personnel, usually with a total of approximately 50 to 60 years experience in wildlife enforcement.

Candidates are then screened and those with the best composite grades are considered for the school. Following this, a thorough background investigation is conducted on each applicant, candidates who meet all requirements are then invited to the Institute of Government, Chapel Hill, to attend a three-week pre-service Wildlife Enforcement Officers School. They are not paid a salary while attending this school; however, meals, lodging and textbooks are furnished. After graduation the successful candidates remain on an eligible list; and when vacancies occur, selections are made according to the standing a person has achieved throughout the school which is a measurement of fairness for employment.

In-Service Training

During the first year of employment, an officer must attend a nine-week school conducted by the Institute of Government and Division of Enforcement personnel. This is required by the North Carolina Criminal Justice Training and Standards Council. Our schools more than meet the standards set by the Standards Council since we have always been academically-oriented and have been holding schools at regular intervals since 1950, both at the Institute of Government and on the district levels.

Success of our schools is further evidenced by the fact that many other states have come to us for information regarding our program and many representatives from various states have attended our schools and then implemented various phases into their own programs.

Duties and Responsibilities

A Wildlife Enforcement Officer's primary responsibility is to enforce the game, fish, and boating laws and regulations. Meeting this responsibility requires patrolling the forests, fields and waters of the State. This patrol is done on foot, in automobiles, in motorboats, and by use of airplanes. Approximately 80 percent of an officer's time is spent on law enforcement. The remainder is spent attending meetings of civic and youth groups, explaining to them the Wildlife Resources Commission's wildlife conservation and boating safety programs and game and fish management. An officer is required to work a five-day week. All uniforms and equipment are furnished by the Commission, which consist of a radio equipped automobile, motorboats, firearms, binoculars, etc. Each officer is reimbursed monthly for meals, lodging and necessary expenses incurred.

All field personnel begin as Wildlife Enforcement Officers. The salary scale for this position begins at $8484 annually and the maximum is $10,644 per year.

The new officer begins in-service training under the supervision of an experienced officer and/or an area team leader and is supervised very closely for several months. No officers can begin their training period in the county of their residence. Only after two years of satisfactory employment can officers become eligible to be transferred back to the area where they lived when employed.

Opportunities exist for advancement to Wildlife Enforcement Officer I, Wildlife Enforcement Officer II, Wildlife Enforcement Officer III, Wildlife Enforcement Assistant Supervisor, Wildlife Enforcement Supervisor, Assistant Chief and Chief. There are six pay grades in each classification with promotions granted on merit.

Benefits

Benefits include annual leave, sick leave, group insurance (hospitalization, accident and life), longevity pay, merit promotions, travel expenses paid, overtime compensation (holidays), workmen's compensation, and an excellent retirement plan.

Reputation and Respect by Sportsmen

The Division of Enforcement of the North Carolina Wildlife Resources Commission has gained recognition for its outstanding performance in training, enforcement techniques and success as professional officers. It has gained the respect of the public for its honesty and integrity.

We are an equal opportunity employer and those persons interested in becoming Wildlife Enforcement Officers are welcome to contact their local officer or visit the headquarters in Room 402 of the Albemarle Building, 325 North Salisbury Street, Raleigh, North Carolina.

TURKEYS In The Fall?

by Curtis Wooten

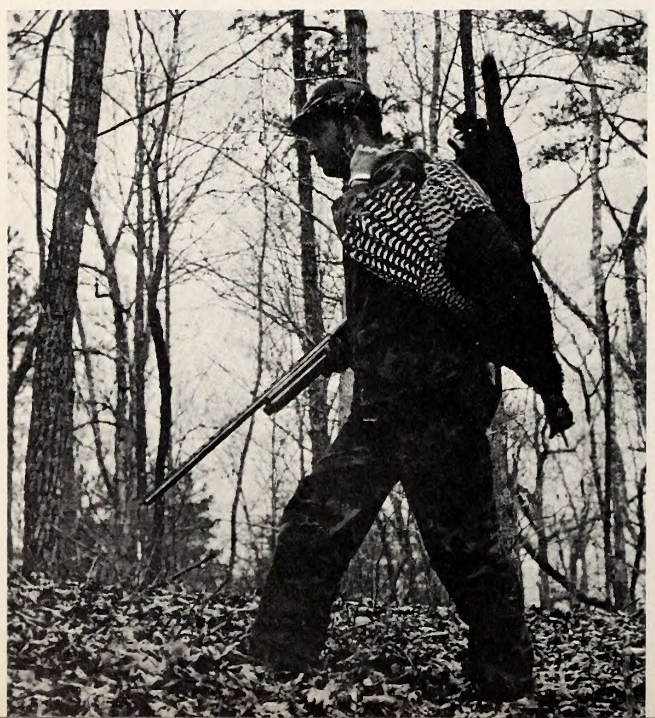
The success of the turkey restoration program at Camp Lejeune points the way to a brighter future for the wild turkey in North Carolina.

THE Camp Lejeune Marine Corps Base, located in Onslow County in coastal North Carolina, does not conform to the movie version of a military training installation. Granted, there are acres of concrete and asphalt, restricted areas, large training and parade fields, tanks, amphibian tractors, jeeps and a host of troops marching, jogging, digging fox holes and generally doing their thing.

But there is another side to Camp Lejeune: the quiet solitude of the long leaf pine, scrub oak forests, the pocosin bays, the estuarine river and creeks and the surf beating on uninhabited shores. The variety of wildlife—be it black bear, deer, wild turkey, osprey, red-cockaded woodpecker, bluebird, alligator or sea turtle—is surpassed nowhere in the state.

The variety of wildlife species and their abundance on the Base is no accident. It is the result of diverse habitats and the dedication of present and past Commanding Generals to sound environmental resource management, combined with hard work by the personnel of the Natural Resources and Environmental Affairs Division which formulates and implements the management plans.

Whether this will once again become a fall scene depends on many factors. One of the primary objectives of turkey management is better hunting along with an abundant, healthy turkey population.



Camp Lejeune was granted a one-week (November 22-30) either-sex turkey season this past fall—the first and only fall season on wild turkey in North Carolina in several years. The growth of the turkey population which justified the fall season is a good example of the results expected from the preservation of habitat (in this case, a result of acquisition of land for the military base) and a sound turkey restoration program and management plan.

There are several reasons for the success of the turkey program at Camp Lejeune. There is adequate, good quality habitat—marked by mature pine and swamp hardwood forests interspersed with small openings and open ridges. Initially, a low but stable population of wild birds was present.

The backbone of their success story is the close coordination of timber and wildlife management activities coupled with intensive habitat improvements.

Excessive logging—the primary cause of the decimation of the turkey population in the state originally—generally has an adverse effect on turkey habitats, but those effects can be minimized if management plans are closely coordinated. Small clear-cut and thinning operations, controlled burns and reseeding have taken place on Camp Lejeune for a number of years with no serious adverse effects to the turkey population.

Extensive habitat improvements made in conjunction with timber harvests offset most of the adverse effects of timber cutting on the Base. Access roads have been systematically seeded to provide alternate food sources and travel lanes for wildlife and to check erosion. Nearly 200 food plots, from one to three acres in size and dispersed throughout the estimated 65,000 acres of suitable habitat, have been cleared and seeded to clover, winter rye, bahia grass or chufas. These serve as additional food sources and provide sunning, dusting and general loafing areas for the turkey and other wildlife (such improvements have been made and are presently being expanded on Game Lands throughout the state).

Forest openings and food plots with their diversity of plants and insects are important to most wildlife species. They are of particular value, however, to the wild turkey which utilizes them year-round.

Feral dogs and cats, serious obstacles to turkey restoration in some areas, are strictly controlled at

Forest openings planted with winter rye are checked by turkey specialist Wayne Bailey (below left) and Base wildlife technician Charles Peterson. These food plots serve turkeys the year 'round. Right, mast producing trees such as the turkey oak, provide important food for turkeys, and should be retained in timber cutting plans.

PHOTOS BY THE AUTHOR

Chufas, a member of the sedge family and also known as sweetrush, flatsedge, and galingale, are a choice food of wild turkeys. The tops (left) appear grass-like, and do produce some seeds, but it is the peanut-sized tubers (right) that are the main attraction to the turkeys.

Camp Lejeune, a feat difficult to duplicate in most areas of the state. With strictly controlled access to the Base and continual patrolling by military wildlife protectors, illegal kills are kept to a minimum. Statewide, illegal hunting is a factor which is difficult to assess, but is known to be significant in some areas.

Already, the groundwork has been laid for the expansion of the wild turkey population in North Carolina, and hopes are that this expansion will be as spectacular statewide as it has been at Camp Lejeune. Long-range restoration plans and management guidelines have been formulated, turkey-oriented land management on Game Lands has been implemented, occupied range and suitable habitat have been mapped and trapping and restocking activities are well under way.

During the past five years, three major changes have been made which improve the chances of success and speed up the restoration program. First, the long winter, male-only season has been eliminated and replaced by the spring bearded-turkey only season (the spring season, scheduled during the period when the hens are nesting, largely eliminated the possibility of female birds being killed). Secondly, legislation preventing the release of pen-reared birds has been passed. (Pen-reared birds are often carriers of several wild fowl diseases, and when released into the wild, they may infect and decimate existing wild stock. They are also ineffective as a means of reestablishing wild populations.) And third, reporting turkey kills has become mandatory, giving biologists better figures on harvests and occupied range—information essential in evaluating restoration efforts.

Over 200 wild turkeys have already been live-trapped on areas with stable populations (over 100 of these from Camp Lejeune) and released on 12 Game Lands areas across the state. According to Wayne Bailey, wildlife biologist and turkey specialist in charge of the turkey restoration program for the Wildlife Resources Commission, most of the stockings have been successful and all still provide hope. It is too early to fully evaluate some of them, but better than half of the populations appear to be expanding well. Live-trapping efforts were stepped up this winter, and as more seed stock becomes available from areas already restocked, the restoration program should continue to expand until wild populations are restored to suitable habitat throughout the state. Bailey says that we may have from 10,000 to 15,000 wild turkeys in the state by 1985 if nothing goes seriously awry. With a well established population of that size, a surplus of birds will be available for the hunter and a fall season will likely be reinstated statewide. In fact, establishment of such a season is one of the foremost objectives of the project.

Perhaps, in the not too distant future, the hunter can once again take to the field in the fall to bag his Thanksgiving or Christmas turkey just as his forefathers did. In the meantime, spring hunting for gobblers is a sport that is hard to beat. ▲▼

TWO FISHERMEN

by Lewis Bridgers Lawrence

LAST Tuesday evening I drove down to the spillway below Sunset Lake. I often go there to fish, mostly for the bluegills and crappies that nest in the black water during the early summer. The fishing is better in the millpond than up above in the lake; the fish are more concentrated. They fall over the dam and they come through the big pipe where the mill used to be; some come upstream from the larger creeks and rivers.

I've caught seven different kinds of fish in the millpond: bass, perch, channel catfish, crappie, bluegill, the beautiful yellow sunfish, and a large-mouthed black bass whose fins turn a bright orange in the spring and early summer.

The fish are not all in the millpond at one time with the species and numbers changing almost daily. When the large catfish and bass come upstream the small fish that are easily eaten disappear. They reappear when the predators drift back downstream or are caught by one of the local anglers who fish here regularly.

The birds I respect and love. They are company for me when I fish. I wouldn't come as often if it weren't for them. The little brown sandpipers are my favorites. I used to call them water ouzels because I'd read so much about those little birds; I know now that this isn't the place for them. The kingfishers are good to have nearby also, but they're rarely seen. Usually I hear the pair that live along the stream calling each other. Once an intruder kingfisher arrived and there was a great screaming battle, flashes of blue chasing each other along the stream bed or twisting off among the trees. They were intent in the chase and I got a good look at all three birds.

Yet the 'pipers will always be my favorites. They are such serious comedians, bobbing their tails when they walk along the shore searching for the small things they eat. Their most profound moments of scrutiny and appraisal are always interrupted by a ridiculous tail bob. That's the only real trick they have in their act, but it keeps me looking forward to seeing them whenever I'm fishing.

I can't call what I do fishing exactly. I know the places where the fish will be and some of the places I avoid because I don't want to catch nesting fish I've already hooked. Right or wrong, all the fish I catch are thrown back after I've had a chance to admire them. I don't have to worry about meals the way some of my fellow-fishermen do. Occasionally I'll give a good fish to Hattie or Nellie or Trunella, but usually I'd rather throw it back.

Many of the fish are parasitized, a few very heavily. This is to be expected in a concentrated situation like the millpond and the stream below. There is less territory for the parasites to cover, and any fish lacking its full defensive mechanisms is sure to be attacked by fish tapeworms or leeches or protozoa or glochidia, the larvae of fresh water clams, that clamp on the gills and fins of fish like split shot sinkers on fishing line.

Fresh water clam shells litter the banks in the shallow sandy places. Raccoons come at night to dig them out of the water and break them open on shore. I haven't had the patience yet to wait for a raccoon. Mosquitoes are part of the reason. I'm still hoping to come upon an early riser in the evening.

This Tuesday when I arrived there was only one other person at the millpond. A boy with thick brown curled hair and an armful of rods.

There were dead snakes on the rocks beside the dam where he was fishing: big, harmless water snakes that liked to sun up there during the day. I knew them—they had been a part of the millpond. I was turning to go downstream below the bridge when he called me.

"You got a gun on you?", he asked.

"What for?"

"I got a big bass in the pool over there on the other side. Got him blocked off with two others but I can't keep him on a hook. I done snagged him twice and he won't stay on."

"Let's take a look at him."

"You got a gun?", he repeated.

"Well, no, but I might be able to figure out a way to get him out."

"How?" The boy was getting suspicious.

"I'm not sure yet. Let's just take a look first."

The boy was reluctant, but he led me across the concrete platform that stretched from one end of the bottom of the dam to the other. I had never gone across the pond this way. The water coming over the dam barely covered the platform, keeping it just wet enough for the slippery concrete algae to survive. On the other side, where the water came down over natural rock, I had to stoop with my hand on dark wet patches to keep from falling. When my hand came off the rock it was covered with short brown worms, flat and broader at the hind end where their suckers were. They were the larvae of some tiny fly, a pond-fly with a single pair of wings. When they finally hatched there would be a tremendous cloud of flies over the millpond. They wouldn't be bloodsuckers. I hoped I could be there when they came out.

At the top of the dam a 'piper was picking and bobbing industriously around the dark patches. Now I knew what he was after. There were enough worms in a few feet of rock and concrete to keep him fed for weeks. He flew off after a few seconds, over the dam and across the lake.

"Have you seen him yet?" The boy was watching the water. "I can't. Don't think the sun's right."

I saw her. It had to be a female bass, heavy with eggs and obviously looking for a nest. She had pushed her bulk down among the rocks in the deepest part of the pool. Now she was motionless, waiting.

"She'll go twelve pounds at least," I muttered.

"That's what I thought. I got him blocked up good now, so I'm gonna come back tomorrow with my neighbor's thirty-thirty and kill him."

"Won't that spoil her for eating?"

"Naw, I'll shoot him in the head. All I know right now is I'm gonna get him no matter what."

"Well, good luck," I said, really not meaning it, and walked down the path to my car. Illegal, immoral, unethical; but what do you do? I hadn't even put my rod together yet. There was no use staying now when I knew I'd be back later in the night. The best nesting spots for big bass were far downstream.

Raleigh, 5-21-75

Fish Print Series Available

The Wildlife Resources Commission is offering this set of six prints of popular Tarheel fish, ready for framing, for $10.40, postpaid. The set includes the black crappie, largemouth bass, smallmouth bass, bluegill, rainbow trout, and the brook trout. A leaflet describing each fish and its habits is included. These prints are from original paintings by Duane Raver, and all but the bluegills have appeared on the covers of "Wildlife In North Carolina." The bluegills are used courtesy of the Virginia Commission of Game and Inland Fisheries, and appeared on a cover of their magainze, "Virginia Wildlife." Send your check or money order along with your complete name and address to Fish Prints, Wildlife Commission, 325 N. Salisbury Street, Raleigh, NC 27611. These are not available individually.

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

Conservation Summit

North Carolina is host to one of three Conservation Summits planned by the National Wildlife Federation this summer. The Blue Ridge Summit is scheduled for Black Mountain, N. C. June 26-July 2. A wide range of nature-oriented activities are planned for the whole family. For more information, including price, courses, etc., write the NWF Conservation Summits, Dept. JG, 1412 16th St., NW, Washington, D. C. 20036.

Free Courtesy Motorboat Examinations

U.S. Coast Guard Auxiliary Flotilla 17-1 (formerly Flotilla 93), Winston-Salem, is conducting the following courtesy boat safety checks. For further details, contact Carl B. Wallace, Jr., 175 Crepe Myrtle Cir., Winston-Salem, N. C. 27104.

Date	Time (if applicable)	Location
May 2	1:00-6:00 P.M.	McKnight Marine, Greensboro, N. C.
May 13	6:00-9:00 P.M.	Western Electric Co., 2400 Reynolda Rd., Winston-Salem, N. C.
May 30		Carolina Campin and Marina Belews Creek Lake
June 5		Midway Marina, Lake Norman
June 6		Commodore Marina, Lake Norman
June 6		Midway Marina, Lake Norman

Other examinations for July and August will be announced in the June magazine.

Sportfishing Short Course

There are still several openings for participants to attend the annual Sportfishing Short Course at Hatteras, June 13-18, 1976. This great learning-doing fishing week is conducted by the Division of Continuing Education of N.C. State Unversity. For details and application forms, write Denis Jackson, Continuing Education, Box 5125, Raleigh, N. C. 27607, or better yet, call Denis at Area Code 919, 737-2261.

Need a Guide?

We can all use a little help in finding the fishing hotspots along our great Tarheel coast. The new edition of "N. C. Coastal Fishing and Vacation Guide" is available from the Graphic Press, Inc., Box 26808, Raleigh, NC 27611, at $3.50 each, postpaid.

It's a What?

Don't blame Sam Capps for calling the mounted hooded merganser a bufflehead in his display pictured on page 22 of April Wildlife; he knows better, and the cutline writer does too . . . now.

Fun to Learn

BY ED JENKINS

Boating accidents in North Carolina claimed 58 lives during 1975 as compared with 41 lives lost in 1974. The total number of reportable boating accidents increased over 25 percent during the same period. From a quick look at these figures, it may appear boating is becoming more dangerous. Maybe it is, but probably not.

Actually, the rise in boating fatalities in 1975 resulted from boating activities and accidents declining in 1974, due to the gasoline shortage, then returning to the pre-embargo levels in 1975 as more fuel became available. The decline in boating accidents in 1974 was predicted (*Wildlife,* May, 1974) by Wildlife Commission personnel and can be seen in the figures below.

Boating	1975	1974	1973	1972
Fatalities	58	41	54	61

Information used in developing statistical data as to the causes and frequency of boating accidents is acquired by a careful study of boating accident reports submitted by boat operators involved in accidents. Boating accidents on public waters of the state must be reported to the Wildlife Resources Commission if any one or more of the following occurs:

(a) Loss of life

(b) A person loses consciousness or receives medical treatment or is disabled for more than 24 hours.

(c) Actual physical damage to property (including vessels) in excess of $100.

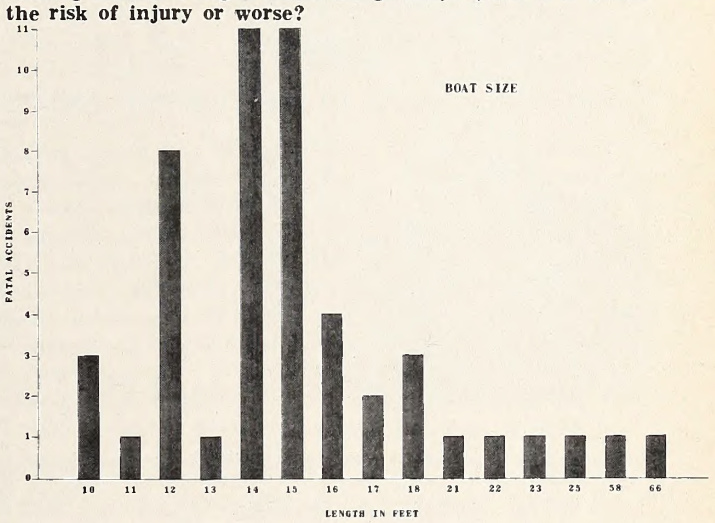
(d) A person disappears from the vessel under circumstances that indicate death or injury.

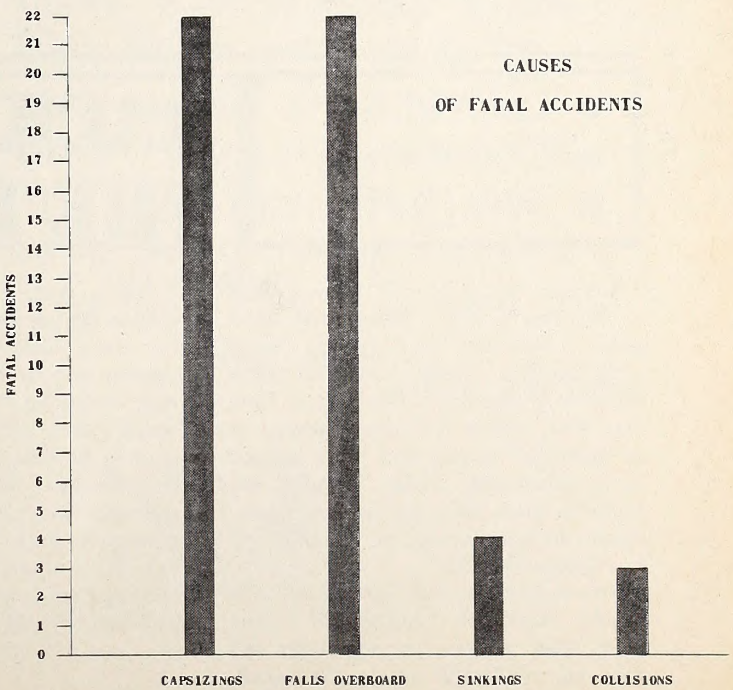
Boating accident reports received by the Commission's Division of Motorboats and Water Safety show that most accidents occur during the months of greatest boating activity. Weekend afternoons are prime boating times, and it is during this time that most boating accidents occur. As to be expected, there is a higher incidence of boating accidents in warm weather months; however, one has a better chance of surviving a boating accident in the summer than in cold weather. During the winter, colder water temperatures reduce survival time, and fewer boats are on the water to assist others in distress. The boating accident reports clearly indicate extra caution is needed during winter boating activities.

Twelve fatal boating accidents were caused by weather or sea conditions. Ocean inlets were very hazardous during stormy days and claimed six lives during 1975. Several accidents occurred when boat operators realizing that sea conditions were too rough for their boats tried to turn back while in the inlet and were capsized by a wave.

A new study coordinated this year between the Wildlife Commission and the Medical Examiners Office revealed alcohol was a factor in many fatal boating accidents. Toxicology tests indicate two out of three victims tested had been drinking prior to the accident. Of those who had been drinking, over 50 percent had

A careless move, done without thinking—this is how most boating accidents begin. Timesaving? Maybe; but is it worth the risk of injury or worse?



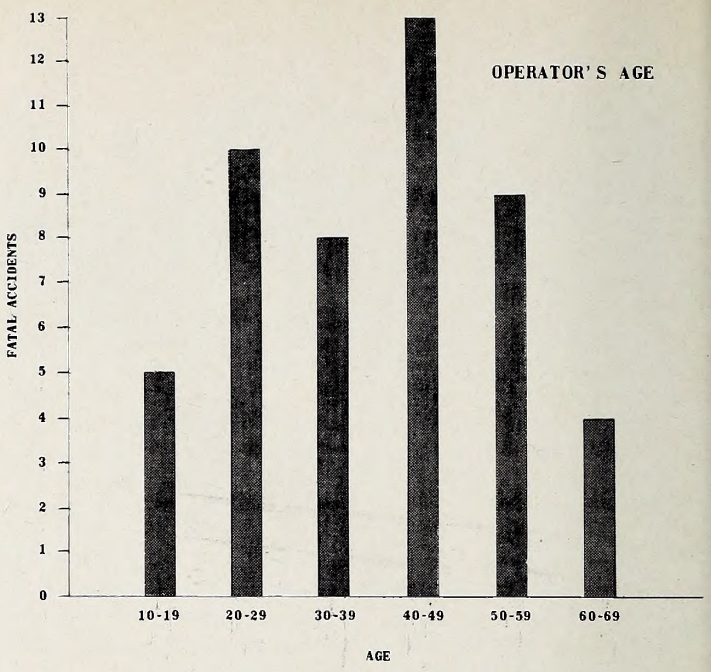


enough alcohol in their blood to be considered Driving Under the Influence.

Unfortunately, boating accidents are going to continue as long as there are people and boats; it's a fact we have to accept. However, boating accidents can be avoided. It's really a common sense matter. All one has to do is be able to recognize the danger; know what action to take; and then take that action in time to avoid the accident. Blind luck may help some to avoid boating accidents, but luck ran out for many boaters last year.

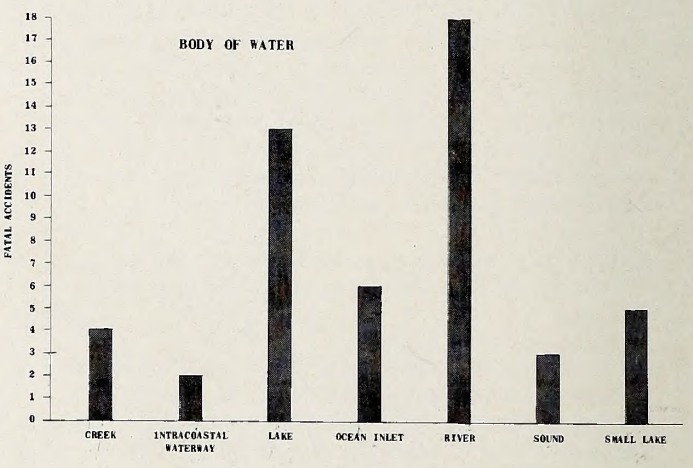
Fatal Boating Accidents — 1975

Month		Day		Time	
January	2	Saturday	15	Morning	8
February	1	Sunday	13	Afternoon	26
March	5	Monday	4	Evening	7
April	5	Tuesday	2	Night	9
May	5	Wednesday	5	Unknown	1
June	10	Thursday	7		
July	3	Friday	5		
August	7				
September	1				
October	4				
November	6				
December	2				



REPORTED BOATING FATALITIES PER COUNTY

Alexander	1	Lenoir	1
Anson	3	McDowell	1
Bladen	1	Mecklenburg	2
Caldwell	2	Montgomery	2
Carteret	4	Moore	2
Chatham	1	New Hanover	2
Columbus	1	Onslow	8
Cumberland	1	Pamlico	3
Currituck	1	Pender	3
Dare	3	Perquimans	1
Franklin	1	Robeson	1
Gaston	2	Swain	1
Henderson	1	Tyrrell	2
Hertford	2	Warren	2
Jackson	1	Yadkin	1
Jones	1		



- Letters
- Comments
- This & That

BACK OF THE BOOK

Blackberry Lily

"Blackberry Lily", **Belamcanda chinensis**, a member of the large family Iridaceae (Iris family), came to North Carolina gardens many years ago from East Asia, where the plant because of its beautiful flowers and fruits is used as an ornamental. Today "escapes" are found in North Carolina near old homesteads, in open woods, on dry hills and in roadside thickets.

The common name "Blackberry Lily" comes from the cluster of shiny splits. The flowers, orange with red dots, are 1½" to 2" across, the sword-shaped leaves are 1" across. Although the fruits look good enough to eat, Harden and Arena in their book, "Human Poisoning from Native and Cultivated Plants" advise "Caution!" in regard to **Belamcanda chinensis**. Quoting this source: "Remember that birds, squirrels, and pets can often eat many poisonous fruits without harm, so do not trust what you see them eat." Nevertheless, we can enjoy this beautiful plant for its beauty alone.

Fred Patterson
Chapel Hill

BOOK REVIEW

John Muir's Longest Walk
John Earl, a Photographer Traces His Journey to Florida
$30.00 published by Doubleday & Co., Inc.
Garden City, New York

It's a bit unusual for a volume of this quality and scope to be tackled by an author and a publisher in these times. Although its producer, the East Woods Press, doesn't say so, my guess is that the book is a fairly limited edition. It certainly is a thing of beauty, and the craftsmanship is first quality throughout.

The enjoyment of the book isn't limited to the outstanding color photos, but they certainly make the difference between a prestige piece and just another nice book. The photographer, John Earl, obviously is a professional, but more than that, he has a feel for his subject and must have truly wanted to create the book.

The text is a diary account of various days and places and events actually recorded by John Muir long acknowledged as one of our greatest naturalists. The thousand mile walk which he took in 1867 from Kentucky to Florida went through the southwestern tip of what is now Nantahala National Forest in the vicinity of Murphy, N. C. Several of the photos are of North Carolina's mountains . . . some of which apparently Muir didn't see but they so impressed the modern day photographer that he included them in the book.

It is about as close to taking the trip with its problems of finding shelter for the night, locating food from local residents, wading among alligators and fighting mosquitoes, as we can come after over a hundred years. Not many of us are going to retrace this historic trek on foot, but can through the pages of "John Muir's Longest Walk." ⬍⬍

Duane Raver

KNOW YOUR ENFORCEMENT OFFICER

Stephen Van Fine was employed by the Wildlife Resources Commission on September 1, 1973, and was assigned to Riegelwood, North Carolina, with a work area in parts of Columbus and Brunswick counties.

Steve is married to the former Candace Garner and they hail from Denton, North Carolina. They have one son, Matthew Stephen. They are members of the Acme Presbyterian Church at Riegelwood, and Steve is a member of Waccamaw Masonic Lodge #596.

Since his employment, Steve has been interested in all phases of the Wildlife Enforcement Officer's job, and especially in the education aspects. He has on numerous occasions given programs on Conservation and Hunter Safety to employees at the Dupont Plant, Leland, North Carolina. He has given programs to Cub and Boy Scouts and Future Farmers on conservation of wildlife, hunting and fishing laws, and hunting safety. He has also talked to a high school class on career opportunities in the conservation field. He has assisted in water safety programs.

Steve has thoroughly discussed with all the Rescue Squads of his area the importance of good examples set by them in the Boating Safety field.

Stephen Van Fine

MY NEW NEIGHBOR MRS. ROBIN

When I first met Mrs. Robin she was ~~waf~~ very fat. She was my new neighbor so I didn't say anything. I was walking past her house and I said to myself "if she's my new neighbor I ought to get her some bread". And so I did. I don't know if she ate it or not. The next day I went over to show her to my Mom. My mom liked her alot. She had a nice house. It was kind of messy. It was brown. It was very small. It had alot of trees around it. It looked nice and shady. It must be a cool place to live. One day I saw her husband. He was carrying home the dinner. It looked nice and juicsy. Some noisy kids came around and made a lot of noise. Mr. and Mrs. Robin went away for about a half of an hour. I don't think they liked kids. Mr. and Mrs. Robin are still living. ~~Their~~ They're the nicest birds I ever met.

THE END

by Mary Widder

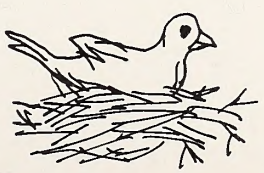


PHOTO BY JIM DEAN

Bass Bug

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Wildlife

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Wildlife

IN NORTH CAROLINA ■

The official publication of the NORTH CAROLINA WILDLIFE RESOURCES COMMISSION, Raleigh 27611. A monthly magazine devoted to the protection and restoration of our wildlife resources and to the improvement of hunting and fishing in North Carolina.

VOL. XL NO. 6 JUNE, 1976

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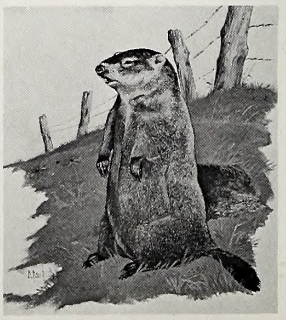
An objective of all levels of government should be to achieve and sustain a balance of the social, ecological, and economic benefits derived from natural resources. Without such balance none of the factors on the scale will be worth weighing.



The woodchuck or groundhog is a curious combination of fact and fancy, good and bad, abundance and absence. This adaptable mammal of the woodland edge apparently is spreading from its original home in the northwestern part of our State, south and eastward as far as Wake and Hertford counties. The woodchuck is hunted fairly widely although it is not classified by law as a game animal. Painting by Duane Raver.

PHOTO BY REX SCHMIDT

All Alone?

It may appear that this fawn has been "abandoned" by its mother, but chances are the adult is nearby. Please don't remove young wildlife from their natural homes. It's unwise and illegal.

Reflections on the Wild Waccamaw

by Charles M. Rucker

I wondered what they were all looking at. I was riding past Lake Waccamaw en route to the start of a canoe trip from the headwaters of the Waccamaw River, and noticed a crowd of people. Perhaps there were 15 of them. From the shore, they looked out over the lake. Others watched from a pier.

* * * * * *

My contemplation was interrupted by a green heron as he flew across the river in front of my canoe. Cackling, he lit in a great cypress and made himself inconspicuous among the moss.

The creatures on the river were accustomed to getting plenty of warning from human intruders. Most folks used motors on their boats or perhaps rowed with noisy oarlocks. By the time these nimrods made the curve, the turtles had long since slid from their logperches and only a few downy feathers lingered where a flock of ducks had slapped the water in departure.

Because of the fashion which I chose to travel, I could get quite close to turtles, as close as I dared to snakes, and usually would be in range to identify a species of duck.

Once a crow—the epitome of alertness and suspicion, flew up the river towards me. I put the paddle down and decided to watch. He lit in the top branches of a tall pine and stood silhouetted against the clear sky. I could even see his bill parting with each call. It would have been a simple shot.

With a soft stroke, I drifted into view.

After suddenly realizing that he in effect had been tricked, he jumped up, made a spectacular twist, and fled in noisy indignation.

Having the satisfaction of beguiling that rascal, and better yet, witnessing his abashment, had made all the effort of preparation worthwhile. Crows take themselves so seriously.

It was good to be unobtrusive and relatively disregarded among the wilderness.

Then it all changed.

My hand, wet with water, slipped off the paddle and slammed against the gunwhale issuing a highly unnatural noise; the woods immediately withdrew into silence. For several minutes, the entire earth seemed to listen as a deadly stillness prevailed. It had taken no time at all for Nature to draw the line and place me on the other side.

Finally a wood thrush, a most foolish and naive little bird, introduced a flute-like solo. From the coolness of a shaded spring the notes came pure and clear. Then a bullfrog resumed his baritone command from the opposite bank. The remote shriek of a hawk began once more.

The river now wound through a series of loops so radical, that according to the compass, I was traveling due north on a river that pushed into South Carolina. Often it would even double-back upon itself, and anyone who wasn't aware of this could spend a lot of energy going around in circles. Another phenomenon was how the force of the river constricted itself through tight gaps, then opened up into flat, calm water.

It was beautiful in many of these chambers. The course had all but stopped, and there was no land anywhere in sight—just cypress trunks, spreading at the base and in such profusion that they obscured each other and most certainly anything behind them. It would be bad to punch a hole through the hull here.

The flow surged and squeezed through a narrow pass, then once again I found myself in a trunk-lined room of gracious dimensions with the water deep and still.

It was here that a snowy egret appeared from behind the form of a partly submerged boat. She froze. But betrayed by her own brilliance, she stood out like a

The slow, meandering rivers of the Coastal Plain provide opportunities for the adventurous floater to see sections of our State that have changed little over the years. Timber cutting, pollution and general misuse blight some areas, but every effort should be exerted to keep these streams as near to their original state as possible. Author Rucker (below) snapped his own photo on the Waccamaw.

Photos by
The Author

beacon in the night. With nervousness past control, a graceful leap was taken and she rose against the black trees.

The contrast was breathtaking. The great wings, the throat in a classic "S" curve, the breast—all were plaster-white. I wanted never to forget any of it. This sublime incident had made a photographic impression in my mind, and for several minutes I could close my eyes and watch it all happen again.

At last the river was beginning to act as I was accustomed for such to do. From the dimness of the last chamber, it opened up and maintained a uniform width, and also went for at least a hundred yards before making a major change in direction.

The brightness of this day, the pines and the high ground on which they are always found looked good to me. Right then, just knowing that there existed a bank, if in the event I was forced to swim, was one definition of security.

The short alders grew thick and hung over the water's edge. In the shadows they produced, I could visualize a big bass waiting patiently for a lizard or toad to make a mistake. What a fine place to flip a purple worm!

On the last bush, I could see a curious round object among its branches. With a few strokes of the paddle, it resolved itself into a huge wasp nest. This didn't belong to the bald-faced wasp who makes the proverbial suspended bag-type nest with a hole in the bottom. This was the work of the paper wasp.

The nest was slightly convex and about the size of a trash can lid. It was the biggest one I'd ever seen. And the creatures responsible for it sat still and in intimate proximity on its ashen surface.

There must have been over 200 of them; each identical, perfect, and ready to make trouble. These had reddish-brown bodies with bright yellow concentric stripes encircling their abdomens. Wasps are one of the few threats that could make me leave the boat.

In passing, I noticed that a few of them had begun to stir while others stood fanning their wings. I was glad to have that behind me.

With malaise I recalled the time at summer camp when a cabin mate, Tim Clayton, found a nest similar to that one. It too, was in the alders, and the boy was in a rowboat. He couldn't swim and must have gotten closer than that which the wasps considered a polite distance, or perhaps inadvertently shook the bush.

Facing the not-so-attractive option of either drowning or being multiple stung, he chose to take the latter.

With his first disbelieving wail, we turned, watching from the dock. Insane with fright and pain, I can still see him madly throwing his arms while the tiny black dots swarmed over him.

I turned ten that summer.

In a rather nostalgic mood, I began to think back on old friends, many being girls, and wondered what had become of their lives. It was strange and rather sad; the way most of them had scattered and somehow been absorbed by the immensity of the earth.

On occasion, when I passed limbs or logs which reached over the water, there would be a strip of white cloth hanging from them. Once I went for a closer look. Here I also found heavy monofilament fishing line wrapped and tied around the limb with enough surplus to reach into the current. I pulled it all in and found only a naked and rusty hook on the end. These strips apparently marked where someone had set trot-lines.

I checked several of them, but not even once had they caught a fish. Invariably they retrieved easily, and an empty hook dripped at their ends. This technique might possibly work for catfish or other slow bottom-feeders that "hunt" by olfaction. But doubtfully would a bass or any of the others which I considered real gamefish, be fooled by such a sophomoric scheme.

I even saw one marked limb where the hook was suspended several feet above the river. Amused, I decided that this one was left when the water was higher, or the angler really expected the fish to work for his dinner!

Mosquitoes had been quite bad since the chambers, and I would hear their faint electric hum and see several of them gently hovering close to my face and arms.

Once I watched one closely as he sat on my wrist, looking for a good place to implant his proboscis. He walked slowly until he came to the soft juncture between two of my fingers, then he stopped. Things must have looked better to him. Momentarily he paused, then leaned forward with proboscis pointed into my skin—really putting his back into it.

I had seen enough. Just at the moment when I was beginning to feel the slight twinge, I slapped him.

He fell dead, and his friends jumped off me, but hung quite close.

I had hoped that it wouldn't come to this. It was such an effort to get to the insect repellent that was in the front of the boat.

Raising out of the seat, I stayed low and painfully reached as far as I could. Barely, I grabbed the strap on the knapsack. Still holding onto both gunwhales, I inched back toward the rear. The bag jingled as I dragged it over the other supplies. Finally I landed on the cushion with a soft "whump," and with the sack in my lap.

I rummaged through can openers, a pocket knife, ball of string, bar of soap, and a snake-bite kit. The familiar little squeeze-bottle had to be here somewhere.

Three mosquitoes had by now lit on my arm and were searching like the first one had done, while another had gotten lost in my ear.

Evidences of man are scattered along the river, but Nature rules in most areas. With the silent approach of the canoe, many wildlife forms can be observed around each bend.

In the deepest, darkest corner of the bag, the beautiful little red and white plastic bottle had nestled itself. Grabbing it, I squirted a generous amount into the palm of my left hand. After throwing the bottle back into the bag, I rubbed it over my hands, arms, neck and face.

Immediately the mosquitoes responded. With deep offense, they hovered frustrated—almost as if there were glass between us. They didn't dare alight, but my world still rang with a high hum.

When I rounded the next bend, there was a man fishing from the bank. He wore a green plaid shirt and sat on a beer cooler. There were several empty cans strewn to his left, one bobbing in the river, close to the bank, and one in his hand. He still hadn't seen met yet.

Sunlight hit the water at a slant and illuminated the limp, kinky fishing line which laid on the quiet surface in loose coils. The line led to a brilliant and very buoyant red and white fishing cork. The white side was up.

He was the first person that I had seen in over a day, and my voice sounded quite loud and strange to me.

"Had any luck?"

He looked up rather surprised, then quickly regained his composure.

Taking one last puff on a very short cigarette, he gingerly took it from his lips and flipped it toward the river. There was a brief but angry hiss.

"Not much. Just a pair of jacks."

Immediately, his response struck a humorous nerve in me, which sounded like a resignation in poker. He reached for a chain stringer that led into the water.

Protesting every inch, the two pickerel were pulled to the bank. Neither one of them would have cleared 12 inches. They hung quietly for a second before they and the chain were dropped back. Once again the water churned and the stringer rattled.

"They sure are bad sports, ain't they?", he asked with a hard smile that confined itself mainly to his eyes. I agreed, nodding.

Remembering all the people that I had seen on the lake shore early the day before, I decided to ask if he knew the reason for the drama. I cleared my throat and listened for my own awkward inarticulation.

"There seemed to be some excitement at the lake yesterday morning. A lot of people were standing around and looking out over the water." I decided to explore the most macabre of possibilities. "Did someone drown?"

Again that secret smile rose to his eyes, and he looked my way. "Naw. Nothing like that. Some college kids found an old Indian boat sunk in the mud. Heard it wasn't much to look at. Just an old log turned up at both ends. I wouldn't have gotten up out of my chair to wait for that thing. Must be a lot of bored people around here."

I could tell he was the kind of person who could be impressed only by bright color and loud noise.

He laid his fishing rod on the ground and reached into his chest pocket for another cigarette. A match flared in his cupped hands as he brought it toward his face.

Just at that moment, the light cork was yanked clear under and the old sportsman made a desperate grab for the rod. He picked it up and whipped it straight back. But since the line was laying in numerous slack rings, the fish had ample time to enjoy a dainty tidbit of sausage at this gentleman's expense before spitting the hook back out.

With knuckles blurred, he cranked in the loose line, then set back with a jerk which made the first one look paltry in comparison. With this action, the entire rig; cork, sinker, and hook shot out of the water with a great sucking explosion. Astonished, he looked in the top branches of the tree behind him just in time to see a brilliant wrapping job completed.

Being totally absorbed in his dilemma, he wasn't aware that the undercut bank on which he was standing trembled with his every move. Supremely humiliated by the treachery of a seven-inch pickerel, he stamped with vehemence.

The next sound was the muffled popping of small roots and light shower of loose soil sprinkling into the water. Then there was a deep, tormented groan and the entire peninsula on which he stood—a little tongue of land about four feet square, slid into the river.

He was a heavy man and his splash was answered by the sound of displaced water raining back down. Great waves slapped the shore, and even rocked the canoe.

Finally, he stood disbelieving, up to his shoulders in the river with his mouth open and eyes blinking. Exasperated and snorting, he pulled himself back up on the bank with great effort.

The little pickerel that he had caught began to stir and once again the stringer rattled.

Water poured from his pants legs and sleeves when he rose off his hand and knees. Pine needles and dirt stuck to the seat of his pants and his discomfort was evident.

I began to wonder what his first words would be. Amazed by the entire affair, I decided that it would be prudent to leave right now before this man turned around and caught me with an unrestrainable smirk on my face. He looked like he might be a rock-thrower . . . or worse.

With a firm push of the paddle on the right side, the bow surged forward and leftwards . . . toward bigger water and best of all, away from here.

It wasn't long before I could hear all types of cursing behind me. This colorful language was punctuated by breaking limbs and the whipping of a fishing rod. Sounds like that carry very well over water, you know.

A beautiful pair of wood ducks clamored as they rose quite near to me. They had tried to conceal themselves among the cypress roots and lilies. Indeed, they had gone completely unnoticed, but my approach unnerved them to the extent that they couldn't stand the suspense any longer. By now, their flight had leveled off into the smooth, powerful wingstrokes that are typical of all ducks. Squealing, they circled off to the side and back up the river.

I then realized that most of the ducks which are flushed on a river tend to head back upstream. Perhaps they know that if they settled downstream, the same boat might surprise them again in an hour or two.

I had been touched. Just knowing about the Indian canoe excavation had made a difference. How many times in the centuries past had men passed this way in the same fashion as I was doing now? Not even the oldest cypress, those giant warriors of time, knew the

entire answer. It was one of the staggering kinds of questions . . . like those regarding stars or grains of sand. The answer wasn't meant to be known and was completely safe from the meddling of human inquiry. And somehow I liked it better that way.

Passing silently under the dangling moss and massive cypress arms, my own canoe suddenly acquired a deeper meaning. Its ribbed hull, the raised and tapered bow and stern, its low profile which allowed me to feel the cool water as it rushed under . . . they were all features implicit to this craft alone.

I knew then that the canoe, like the javelin or the knife blade, was something beautiful in its own basic simplicity. It was refined to its present form ten thousand years before Christ; had withstood the test of time, and was here to stay. The canoe is art in its own right . . . only this art is functional; culturally decisive in fact. Hence the reason for me thinking it to be somehow on a higher order than static art such as painting or sculpture which merely sits there or perhaps looks back at you.

It must have all begun from the moment that the first tired Asian beached his dugout on wild Alaskan shores. Awed, he stood on stiff legs while the laughing slant of his oriental eyes surveyed miles of white tundra. Soon, there would be the smell of campfires among the big woods crispness and heaps of chipped stone in the clearings. Even the wolf learned quickly to fear the prints of moccasined feet in the snow, as well as the hostile sound of a strange new voice. These first people wore skins and were afraid of darkness and thunder. They sang to the moon and worshiped the Great Bear. Many of their strongest sons died with the seasons, yet Man endured.

Over 500 generations later, in the Eighteenth Century, the French trader-trappers made their way up the Saint Lawrence and Hudson Rivers. The song of the broadaxe was heard over the Continent, and the ring of steel on steel echoed in the hearts of the deepest forests. And the canoe, having changed only in size to accommodate up to 15 men and supplies was still slicing the cold rapids.

This design couldn't be improved on. No, not even the White Man who saddled the stallion and made the long bow obsolete could touch it.

Once I heard that the canoe was conceived after its maker observed a leaf on the water. I couldn't recall where I was told this or by whom, but it sounded good.

A light film of yellow pollen on the water's surface slid slowly by. Great swarms of water-striders skated franticly to a safe distance after my wake interrupted some sort of intimate congregation.

Knotted cypress knees rose near the black-soaked trunk of the mother tree. Along the shores there were hundreds of them; each with its own identity . . . their forms being as limitless as the imagination. Some were thick, grotesque and covered with a layer of brilliant emerald moss. Others were bald and timidly peeped only an inch above the surface.

A huge water moccasin that was coiled up on a dry log slowly unfurled itself and eased into the dark water. Each forward surge of the paddle faded into a slow glide. The frequency of this act rested solely on my attitude and energy. The sucking swirls made by the paddle favored tiny tornadoes in the current, and they danced precariously for several seconds after I had passed.

The serenity of the river, my lack of responsibility, and the satisfaction stemming from this lack seemed to induce a certain laziness in me. With paddle across gunwales, I sank low in the seat and stretched my legs high on the supplies. The canoe made no noise, and yet there was the strange sensation of movement.

A tangle of bare limbs passed overhead, then a canopy of foliage so thick that the sun only occasionally winked through. The lovely dappled patterns of light and shade minueted over me, but suddenly stirred to a craze with gentle wind.

Some distant woodpecker—probably a flicker or possibly a pileated, was enjoying himself by hammering on a dead tree with machine-gun rapidity. Each volley varied with duration or intensity. His hollow knock rose from deep in the swamp and lost no clarity in the mid-day calmness.

Dragonflies hovered close on crackling wings. They often rode tandem-style and would shoot away if I motioned toward them.

This peaceful affair was once interrupted when a large horsefly obviously indifferent to the repellent, hung over me for a second, then landed on my cheek. Just scaring these devils away isn't good enough. They all have an excess of courage and invariably return until they can land undetected and leave you with a welt the size of a dime.

I raised my arm slowly until I was sure he was in range. Then with all the quickness in me, I slapped my face. But this time it was worth it. The horsefly, almost an inch long, rolled down my shirt and stood dazed on the floor planking. After picking him up by a wing and examining the huge compound eyes with the iridescent green bands across them, I flipped him into the water.

A curious pattern of tiny virbrations radiated from him on the glassy surface. With the action of his wings, this fly now began to spin with magical speed until he became blurred.

A small bass rose and studied the situation briefly. Then with a silver flash and a soft pop, the insect disappeared in a swell.

All in all, it was quite gratifying.

Soon, the river swept under a large concrete highway bridge. My car should be parked close by.

Mud daubers had made their clay tunnels on its columns, and swallows dipped low over the water. Clearly inquisitive, they often flew so close that I could hear them flutter. They made no noise except for an occasional high chirp. With their swept-back wings and forked tails, they were beautiful to watch. It was cool under the bridge.

I unloaded the boat and pulled it up on the bank.

Soon, my car was loaded and the canoe secured to its roof.

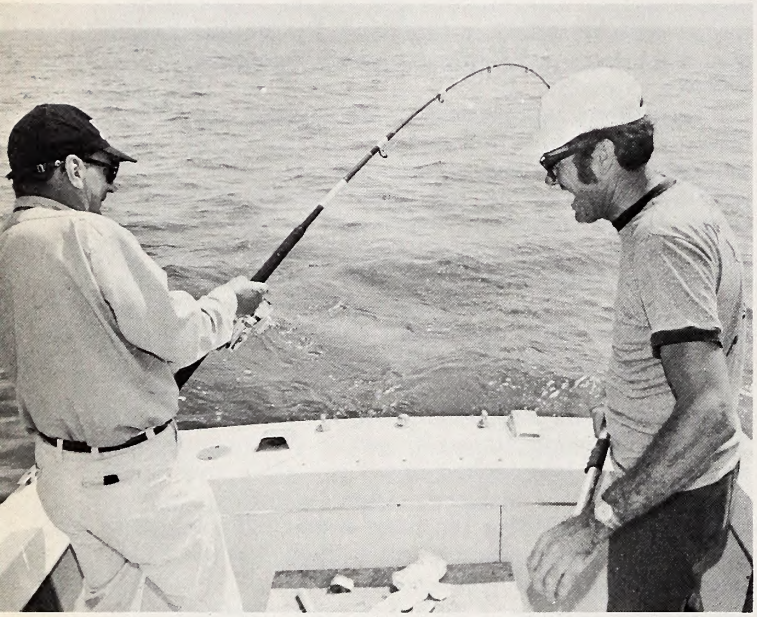
While driving on the straight, smooth asphalt, I began thinking how fortunate I was to live in this part of the country, and of the things which made it special.

The slow tea-water of the cypress rivers . . . lightning bugs blinking against dark pines . . . the dry and spinning churr of the cicadas. They all spoke of the old and tired South. The South, where nights are darkest and the cottonmouth moccasin waits in its massive ugliness. Distant laughter in the fields . . . dirt roads packed and polished by bare feet. It was all good and the way it had always been. ▲▼

HATTERAS COBIA CAPER

by Joel Arrington

Outdoor Editor
N. C. Travel Development Section



PHOTOS BY JOEL ARRINGTON

Bob Peel has hooked a nice cobia in Pamlico Sound near Hatteras Inlet. Guide Ken Lauer gives encouragement and stands by with the gaff. Below, Peel has the fish almost whipped and Lauer is in position to gaff it.

THE best and most consistent opportunity for catching a large and powerful fish in North Carolina's inshore waters is at Hatteras or Ocracoke in June.

About that time—earlier at Morehead City—cobia enter inlets through the Outer Banks and spawn in deep channels. The average fish weighs about 20 pounds, but 40-pounders are common and fish over 50 pounds are caught every season.

Sophisticated technique is not required. Stout rods, large reels and a big piece of bait soaked on the bottom will do the job since cobia are not fussy about heavy leaders, the kind of bait they want, or large hooks.

Migratory patterns of these chocolate brown and white fish are not as clearly defined on the Atlantic Coast as they are in the Gulf of Mexico. Ling, as they are called there, move westward along Florida and Mississippi beaches toward Louisiana and Texas and provide targets from the surf, from piers and charter boats. On the Atlantic Coast, there is both an inshore-offshore migration and a northern movement in spring and summer.

Beginning in late April at Morehead City, cobia may be found in deep holes of the Core Sound and the Newport River. However, fishing is not really productive until May. It reaches a zenith progressively later as you travel northward, peaking in late June at Hatteras Inlet, but continuing through July. Not many cobia are reported at Oregon Inlet, probably because there is little effort for them.

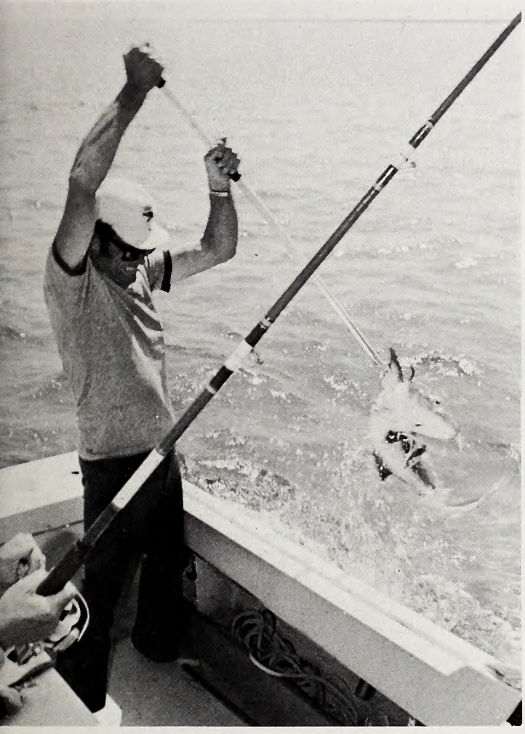
Charters for cobia fishing are available at Ocracoke and Hatteras. They cost about $150 per full day for up to four anglers. Tackle and bait are furnished.

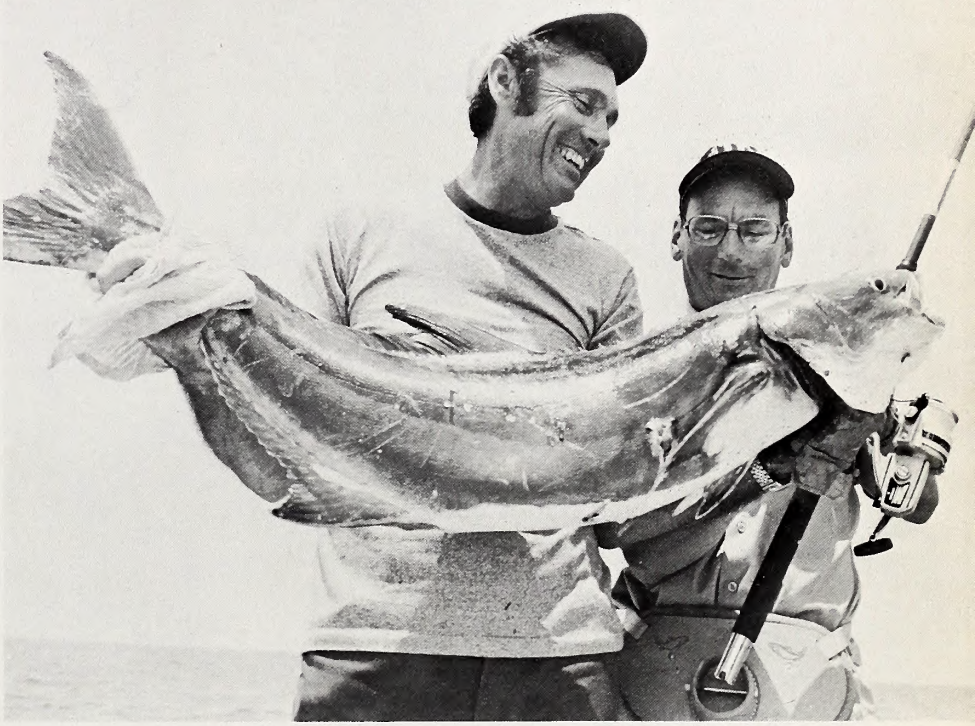
Fishermen with boats suitable for operation in the sound may be successful on their own. Any deep channel west of the inlets is likely water for cobia. The good spots are well known and can be learned by inquiring at marinas. A navigation chart may be helpful if it's your first time.

Tackle suitable for cobia should be rather heavy. Twenty-pound test line on a large open-face spinning reel is about as light as most fishermen want to go. Conventional reels may carry 30-pound test line up to about 50. Rods should be quite stiff, because you need lots of lifting power for these determined fish and the often strong currents in which they are caught.

A simple, single-hook bottom rig is best. A few anglers like the fish-finder rig, but when fishing in deep water, it is more difficult to set the hook if the

You probably won't have to hit the cobia trail quite this early (right), but tide conditions may be important to good catches. After one last surge, the thrashing cobia is gaffed by Lauer. The 30-pounder was dispatched with a billy, and then displayed by Ken as the arm-weary angler looks on.





sinker has slid up your line. Cobia are not shy about dragging six ounces of lead, so there is no reason for a sliding sinker.

You will need about four feet of heavy mono leader. One hundred-pound test will do. Wire is satisfactory, but less comfortable to grasp at gaffing time, and not necessary since cobia do not have sharp teeth.

Most cobia guides recommend as large a hook as you can set with the tackle you are using. With 30-pound test class tackle, you should use a 10/0 that has been carefully sharpened. A 7/0 is about right for 20-pound test.

The best bait is a fresh, oily fish cut in half and hooked through the head. Menhaden are good, as are croakers and spots. In a pinch, you can use frozen squid. Occasionally, marinas have fresh bait, but more often they have only frozen herring, which will serve, but it is inferior to fresh bait. Inquire at commercial fishing docks where you often can get bait for free or very inexpensively.

Whether you should chum is debatable. Most guides do not, because they catch fish anyway. Chum draws skates, rays and sometimes sharks, not to mention crabs which can clean your hook almost before it hits bottom.

Cobia seem to bite best on a certain stage of the tide, either rising, falling or slack. The trouble is, their preference changes. Early in the season, they may like the ebb, later the flood, or vice versa. Once you have established when they are feeding, you might as well fish for something else during the quite periods.

The one essential piece of auxiliary equipment is a long-handled gaff. Very desirable is a box in which to drop a freshly gaffed cobia. The species is notorious for thrashing about after they are boated, sometimes causing damage to boats and tackle and injury to fishermen.

Cobia are one of the best food fish. The flesh is white and firm. Only in large fish is it tough. A piece of fillet from a fish under 20 pounds, broiled in lemon and butter, is one of the better things in this life. Many people who don't like fish are fond of cobia.

In the accompanying photos, outdoor writer Bob Peel gets his first cobia with guide Ken Lauer of Outer Banks Safaris. ▲▼

● *Every year thousands of dedicated fishermen journey to the North Carolina coast. They come to match wits with an elusive and unpredictable prey—a scaly demon that lurks deep in murky waters—the fish. Their search takes them far out to sea in small boats. It's often long and strenuous and sometimes they search in vain.*

The noble fisherman may wonder aloud what manner of beast it is that refuses his tempting bait or what the strange world of their prey is like.

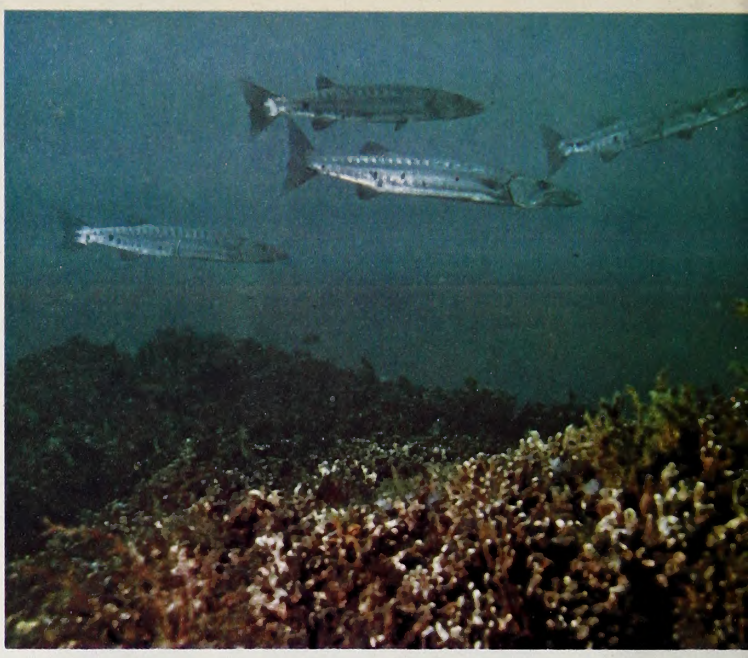
No one has yet figured out fish logic but we do know that it's a fascinating world the fish lives in, a world so close to the fisherman but a world he may know little about. After all, the most intimate contact most North Carolina fishermen have had with their catch has probably been in a seafood platter served with hush puppies and cole slaw.

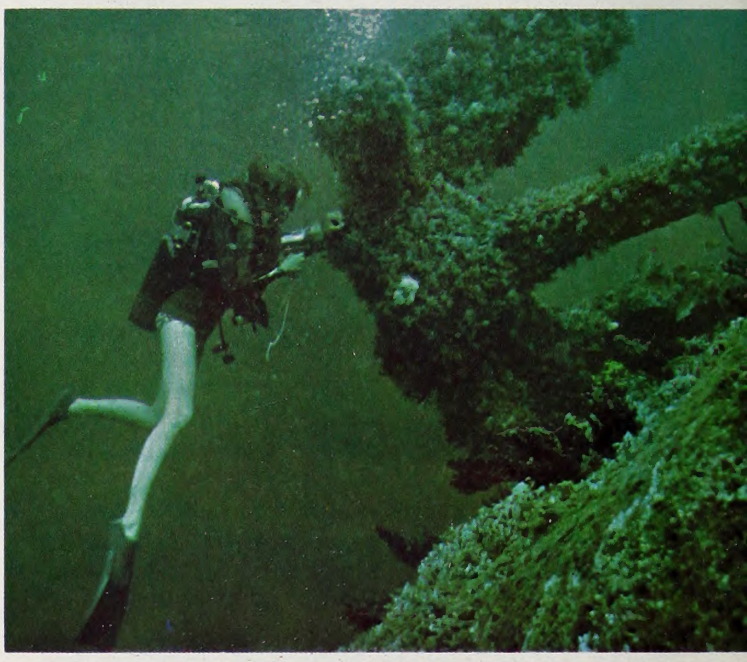
Many of the fish we catch off the North Carolina coast make their homes in the numerous offshore shipwrecks. The North Carolina coast has literally thousands of shipwrecks. The unpredictable weather and tricky shoals gave it the justly deserved name "Graveyard of the Atlantic."

The wrecks form a neat, self-contained ecosystem much like the coral reefs of the Caribbean. First come little fish, then big fish to eat the little fish and then bigger fish that we try to catch.

The broken and twisted remains of the giant World War II wrecks, for instance, make excellent homes for fish. Every weekend many fishermen drop lines on the sprawling carcasses of great freighters and tankers of another era: the John D. Gill, the Esso Nashville, the Hutton, the Papoose, the Atlas—names that are rich in lore.

But now, to the fisherman trolling over these wrecks they're just another "good spot" somewhere out in the vast ocean. All he cares about is that there are lots of big ones down there. But are you ever curious, just a bit curious to see what your bait sees just before it's gobbled up by a monster? It could surprise you, in fact you might even see the one that got away.



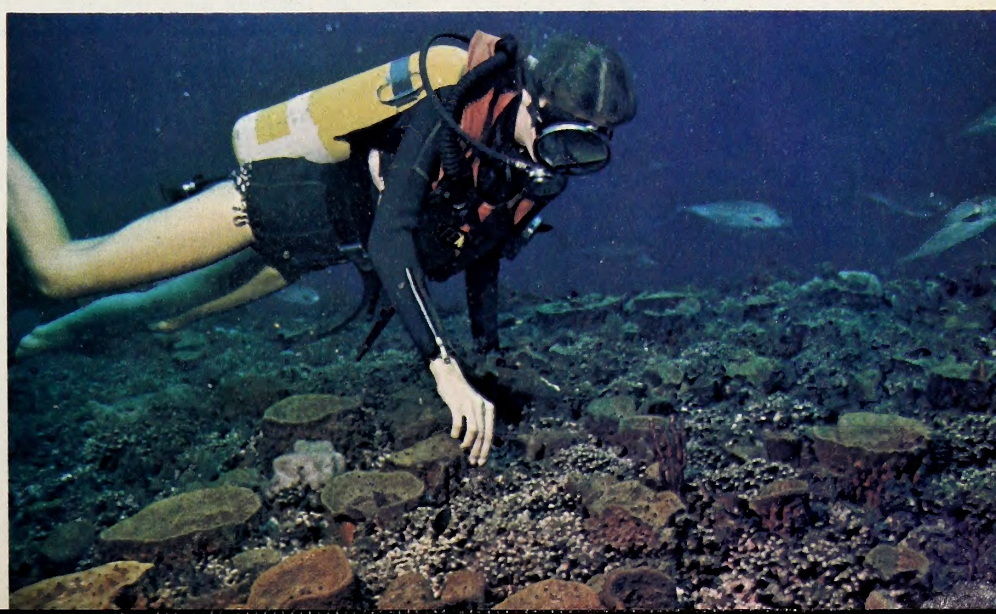


a world the fisherman never sees

Four hungry barracuda (left) wait for their next meal to swim by over the bollers of the Buoy 13 wreck (the Suloide). This World War II tanker sank after a collislon with the sunken carcass of the Hutton. At right, diver Lynn Smith pauses over two giant mooring bollards from the deck of the John D. Gill.

Miss Smith examines the giant starboard anchor (left) of the John D. Gill. This hulk is marked by Bouy WR4 and is 27 miles off Wrightsvllle Beach. The 500 foot torpedoed tanker rests nearly upright in the sand and is a favorite spot for fishing. This school of amberjack cruises over the wreck (right).

Diver Donald Keith, a marlne archeology student from Chapel Hill, examines a large starfish (left) found on the wreck of the Hutton off Morehead City. The Hutton, another large tanker, was sunk by German U-boats and lies 60 feet deep. Lynn Smith, one of the few women divers to explore the "graveyard of the Atlantic," drifts over a field of sponges on the deck of the Gill. (right) This wreck forms a "false bottom" about the size of a football field nearly 50 feet above the true ocean floor.



Text and Photos by Bill Lovin

Arribada

by Joan Warlick
Photos by Jim Warlick

The depositing of the 112 eggs took about a half-hour and had an attentive audience. Hatching and subsequent survival have many perils.

I have just returned from an arribada. According to THE NATIONAL GEOGRAPHIC, arribada means "arrival." This phenomenon took place on the shore of desolate Hammock Beach State Park, off the coast of North Carolina.

Our party of 19, five adults and 14 youngsters from eight to 16, were camped on this small uninhabited island with the express purpose of seeing the turtles come from the sea to lay their eggs. The sea turtles, following an old ritual, come ashore under the full moon at the highest tide in June to lay their eggs and cover their nests.

About ten o'clock on the night of June 23rd, a 175-pound loggerhead turtle emerged from the waters beneath the light of the full moon and lumbered away from the water mark of high tide toward a sand dune.

At this time some of us were sitting around drinking coffee and lamenting the remote possibility of our getting to see a turtle when Claude Crews drove up in his jeep. Claude is the superintendent of the state park. He said they had just sighted a loggerhead about two miles up the beach, and he would drive the adults and small children so we wouldn't miss the event.

We alerted the rest of the camp and all started up the beach.

When we got there the turtle was just finishing digging a nest about 30 inches deep. We knelt by her barnacle-encrusted shell and watched the first of 112 glistening white eggs, the size of ping pong balls, drop onto the sand.

I walked around to look at her eyes. Huge tears welled up and splashed onto the sand making small wet sand balls. The tears had nothing to do with pain or sentiment however. Her lacrimal glands were merely ridding the turtle of excess body salts.

It took about half an hour for her to lay the eggs and then her rear flippers began to rake sand over the nest. When it was covered, she immediately began turning her body around toward the sea. In 25 minutes her journey back into the surf was completed.

When we could no longer see her we began our walk back to camp. Sleep came easily to 19 elated people that night.

The park rangers keep a close watch on the eggs, whose parents have been proclaimed by Congress as members of endangered species. Only a third of the eggs will hatch because they are prey for egg-sucking racoons and ghost crabs. After the 60 days it takes them to hatch, 10 percent will make it to water. Of those getting to water only 5 percent will survive.

The experience of watching the arribada is one my husband, eight year old daughter, and I will never forget.

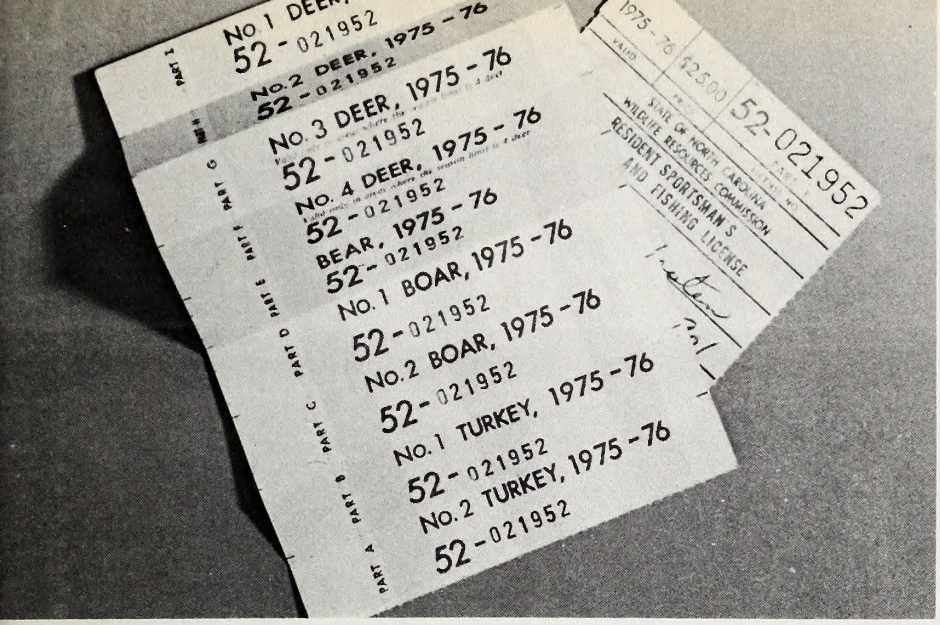
Giant Atlantic Green Turtles

Want to adopt a turtle? Not just a run-of-the-creek tortoise or terrapin, but a giant Atlantic green turtle nesting on a tiny island in the Caribbean?

Any family, school, classroom or nature club that wants to contribute $25 can become the foster "parents" of one of the big marine reptiles, according to the current issue of Ranger Rick's Nature Magazine.

For their contribution, donors will get to name the turtle, receive a picture of it and earn a certificate of appreciation, the National Wildlife Federation magazine for children reports.

The adoption plan, the magazine says, has been devised by the Island Resources Foundation, a nonprofit research group, to finance a study of the big turtles, a species once threatened with extinction in the Caribbean but now making a comeback on Isla Aves (Spanish for Island of Birds) off the coast of Venezuela. To study the turtles' movements and habits, the researchers will tag them. Adopting groups will subsequently be notified if their turtle returns to the island. Donations to the program may be sent to the Island Resources Foundation, Inc., P.O. Box 4187 RR, St. Thomas, U.S. Virgin Islands.



Mandatory Big Game Tagging

by Curtis Wooten

"WHY is it necessary that we report our big game kills to the N. C. Wildlife Commission?" big game hunters often ask.

It's a legitimate question which deserves an answer.

Tagging and reporting the harvest of some big game species namely black bear, female deer and wild turkey, has been a mandatory requirement of sport hunters in North Carolina since 1973, but the 1976 seasons will be the first in which it will be mandatory that North Carolina hunters tag and report their kills of all big game animals, including antlered deer and wild boar.

The information to be obtained from the hunters' reports will provide invaluable information for use in the management of North Carolina's big game populations. Though many different methods have been tried, there is no other means of getting accurate big game harvest figures.

North Carolina's big game populations are constantly changing. They change in response to man's manipulations of their environment such as land clearing, wetland drainage, logging and urbanization. They change in response to pressures exerted on them by outdoor resource users such as campers, hikers, nature photographers, motorcyclists, and four-wheel drive vehicle enthusiasts, to name a few. And, they change in response to hunting pressures.

Of these, hunting is the most obvious of the forces directly affecting big game numbers, though not necessarily the most significant.

There has been a need for accurate data on the harvest of big game animals in the state for many years. Commission biologists have been "making do" with information gathered by means other than direct reporting of big game harvest to evaluate the status of populations and in setting regulations. Mail surveys, hunter interviews, field surveys and other methods of gathering information on big game harvests are slow and tedious and the results are somewhat less reliable than direct hunter reports of their kills. Such methods have been used exclusively in the past, but with increased pressures on big game populations, they, alone, are no longer adequate.

North Carolina's deer herd is larger now than ever before—estimated at around 400,000 animals and rapidly expanding. It is known that more sportsmen take to the field annually in search of their trophy buck; yet, truly accurate figures on the total deer harvest and the locations of kills are not available.

The state-wide turkey restoration program is in its fourth year with wild birds stocked on 14 new areas in the mountains and coastal regions and native populations expanding throughout much of the state. Kill data is essential to the evaluation of the success of restoration projects and in planning future programs.

Changing land-use patterns are causing serious problems for the black bear in parts of the Coastal Plain and to a lesser extent in the Mountains. Kill figures reflect changes in the population—gradual or sudden—and when combined with information gathered from research and related projects, they provide a good picture of the status and direction of change of the population.

The management of big game populations in North Carolina must be based on the most reliable up-to-date information that can be obtained. The tagging and reporting system going into effect this year is designed to provide such information on big game harvest. It will not solve all the problems Commission biologists are confronted with in managing North Carolina's big game populations, but it will close a large gap that has been present.

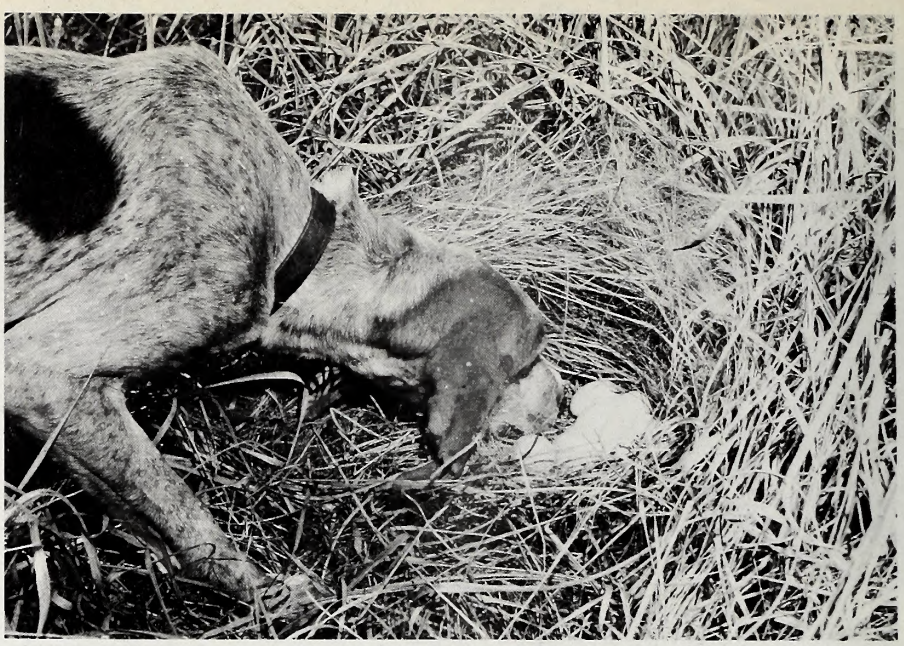
The success of the tagging and reporting system lies with you, the sportsman. With your cooperation, our deer, bear, boar and wild turkey populations can be better managed to maintain optimum numbers—with an annual surplus available for harvest by sport hunters.

Details on how the system works next month.

What Do You Mean, "Man's Best Friend"?

Do We Protect Him Or Neglect Him?

by Lunette Barber



Eggs and young of ground-nesting birds, including bobwhite quail, are vulnerable to free-roaming dogs. The destruction of such wildlife is great but difficult to estimate and calculate.

IF a dog is man's best friend, why are so many so sorely neglected by their owners? Large numbers of them are poorly fed, poorly housed, and completely lacking in health care. The greatest neglect of all is allowing them to roam freely over neighbor's property where they are very destructive and "messy" on lawns, flowers, and shrubs. A roaming male dog can be very destructive to shrubbery. Sometimes a poorly trained dog is a nuisance in a neighborhood by excessive barking, especially at the wrong time of day or night. In rural areas stray dogs soon become what are called "self-hunting" dogs and may form in packs and run wild.

Johnston County, North Carolina, was among the first in our state to have a dog-control program. It began April 6, 1953, and 349 "self-hunting" dogs were impounded that year. In 1974 the dog warden took 2,537 dogs, and he claimed 2,391 in 1975—quite a large number of homeless dogs for a county of less than 65,000 population with a land area of approximately 800 square miles!

Just what is the situation on dog control in the other 99 counties of North Carolina, and in the other 49 states? Could the number of strays, and the number impounded be anywise in proportion per population and per square mile with Johnston County? If so, one could correctly conclude that the nation is literally "going to the dogs"! It is believed that the experience in this county may be considered typical for the nation and points up the fact that more and better dog control is needed everywhere. The numbers of stray dogs, and the damages and injuries inflicted by them continue to increase.

The reasons why more and better dog control is needed are serious and many: Everybody knows about today's high costs of food—food for both people and pets! Costly damages and injuries to many persons occur in the United States every year from dog bites—estimated in the ten of millions of dollars, and sometimes the injuries are disabling and permanent! The cost of destruction of wildlife which upsets Nature's balance is so immense it cannot be estimated!

The three most popular upland game birds in North Carolina are the bobwhite quail, the ruffed grouse, and the wild turkey. The young and eggs of this group, and of all other ground-dwelling birds are easy prey for stray dogs.

All wild ground-dwelling and subterranean mammals both large and small are vulnerabe to strays. A hungry dog can easiy overpower the larger female wild mammals just before they give birth to young. In rural areas, packs of strays gone wild often attack and destroy livestock such as cows, sheep, and hogs.

Dogs, especially strays, are sometimes carriers of serious diseases transmissible to man by bite. Rabies for example, with all its complications, everybody—both professional people and the general public, should become thoroughly acquainted with the most recent developments in this disease. The Center for Disease Control (Viral Diseases Division), Public Health Service, United States Department of Health, Education, and Welfare, Atlanta, Ga., 30333, has copies of numerous professional publications with very important information on the subject. A few brief extractions from some of their recent publications are quoted below:

> "Today, with growing numbers of Americans owning pets and camping in the wild, the potential for exposure to rabies is increasing. The Center . . . . estimates that each year over one million Americans are bitten by animals. The problem of whether or not to give them postexposure rabies prophylaxis is perplexing for all physicians." . . . .
>
> "In the United States today, wild carnivorous animals are the most frequent source of rabies infection for man. Seventy-nine percent of all confirmed animal rabies cases in the United States in 1973 occurred in wildlife" . . . . "skunks, foxes, bats, and raccoons are the primary wildlife reservoirs . . . .".

All of this points up the more serious reasons why owners of dogs should protect them carefully. Owners

It's really not the dog which is at fault when he simply does that which comes naturally; it's the dog's owner who should be made to answer for this.

should keep all dogs (and cats, too) regularly vaccinated against rabies. Do not, repeat DO NOT, under any circumstances, fail to keep your dogs and cats vaccinated against rabies!

The Center for Disease Control reports that bites from dogs and cats ". . . . continue to be responsible for most of the approximately 30,000 post-exposure rabies prophylaxis treatments administered annually." The Center reports a total of 19,315 confirmed cases of rabies for the period 1969-1973 of which approximately 78 percent was found in wild animals. The Center also reports "There are regional variations in the incidence of rabies in certain species."—BUT, ALWAYS BEAR IN MIND, wild creatures know nothing of state boundary lines! The disease is subject to spread across state lines at any time, and anyone's free-roaming and unvaccinated dogs and cats are vulnerable at all times!

It has been estimated in Johnston County that fully 20 percent of its dog population goes unvaccinated because of owners' negligence! What is the percentage in the rest of the state and nation? Are you guilty of such negligence?

Dogs are supposed to be tax-paid property and, in areas with dog-control programs (and let's hope this now includes all areas), it is unlawful for them to roam freely and go unvaccinated. People who allow their dogs to roam freely and fend for themselves are not only in violation of the law, they are imposing on their fellow-man!

A stray dog is definitely NOT man's best friend. In fact, a stray dog that has not been regularly vaccinated against rabies is extremely dangerous—what, with rabies on the increase among wild animals; with unvaccinated and homeless dogs on the increase, either one is likely to infect the other and we could have a terrible epidemic of rabies across the nation in a very short time!

Let's declare war on the stray dog population—let's have more and stronger dog control programs throughout the country, including a dog birth control program. Let's educate the public as to the gravity of the problem and urge all to do something about it.

Across the years, many complimentary poems, essays, stories, and eulogies have been written about dogs, but the one that states the case more beautifully and completely is "Eulogy on the Dog" by Senator George G. Vest. It was delivered by Senator Vest at the trial of a man who had shot his neighbor's dog.

"Eulogy On The Dog"

"Gentlemen of the Jury: The best friend a man has in the world may turn against him and become his enemy. His son or his daughter, that he has reared with loving care, may prove ungrateful. Those who are nearest and dearest to us, those whom we trust with our happiness and our good name, may become traitors to their faith. The money that a man has he may lose. It flies away from him, perhaps when he needs it most. A man's reputation may be sacrificed in a moment of ill-considered action. The people who are prone to fall on their knees to do us honor when success is with us may be the first to throw stones of malice when failure settles its cloud upon our heads. The one absolutely unselfish friend that man can have in this selfish world, the one that never deserts him, the one that never proves ungrateful or treacherous, is this dog.

"Gentlemen of the Jury: A man's dog stands by him in prosperity and in poverty, in health and in sickness. He will sleep on the cold ground, where the wintry winds blow and the snow drives fiercely, if only he may be near his master's side. He will kiss the hand that has no food to offer, he will lick the wounds and sores that come in encounter with the roughness of the world. He guards the sleep of his pauper master as if he were a prince. When all other friends desert, he remains. When riches take wings and reputation falls to pieces, he is as constant in his love as the sun in its journey through the heavens. If fortune drives the master forth an outcast in the world, friendless, and homeless, the faithful dog asks no higher privilege than that of accompanying him to guard against danger, to fight against his enemies. And, when the last scene of all comes, and death takes the master in its embrace, and his body is laid away in the cold ground, no matter if all other friends pursue their way, there by his graveside will the noble dog be found, his head between his paws, his eyes sad but open in alert watchfulness, faithful and true even to death."

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

Appalachian Trail Information

For some of the best information about the Appalachian Trail, including that portion in North Carolina, contact the Appalachian Trail Conference, PO Box 236, Harpers Ferry, West Virginia 25425. You will also receive information on how to become a member of this group.

Another Boating Access Area Opened

The Division of Motorboats and Water Safety of the Wildlife Commission has announced the opening of another access area. This one is on the Pasquotank River and is located off U. S. 17 North on Knobb Creek Road. The old access area on the U. S. Highway 158 Causeway has been closed.

Fish Prints Available

The series of six popular fish announced in the May issue of "Wildlife" (page 23) is available at $10.40, postpaid. These 11 by 14 inch full-color lithographs reproduced from original paintings by Duane Raver include the bluegill, large and smallmouth bass, crappie, brook and rainbow trout. Send your check or money order to Fish Prints, Div. E, Wildlife Commission, 325 N. Salisbury Street, Raleigh, NC 27611.

Free Courtesy Motorboat Examinations

U. S. Coast Guard Auxiliary Flotilla 17-1 (formerly Flotilla 93), Winston-Salem ,is conducting the following courtesy boat safety checks. For exact time each day contact Carl B. Wallace, Jr., 175 Crepe Myrtle Circle, Winston-Salem, NC 27104.

Date	Location
June 5	Midway Marina, Lake Norman
June 6	Commodore Marina, Lake Norman
June 6	Midway Marina, Lake Norman
July 3	Commodore Marina, Lake Norman
July 4	Carolina Campin and Marina
July 17	Belews Creek Lake

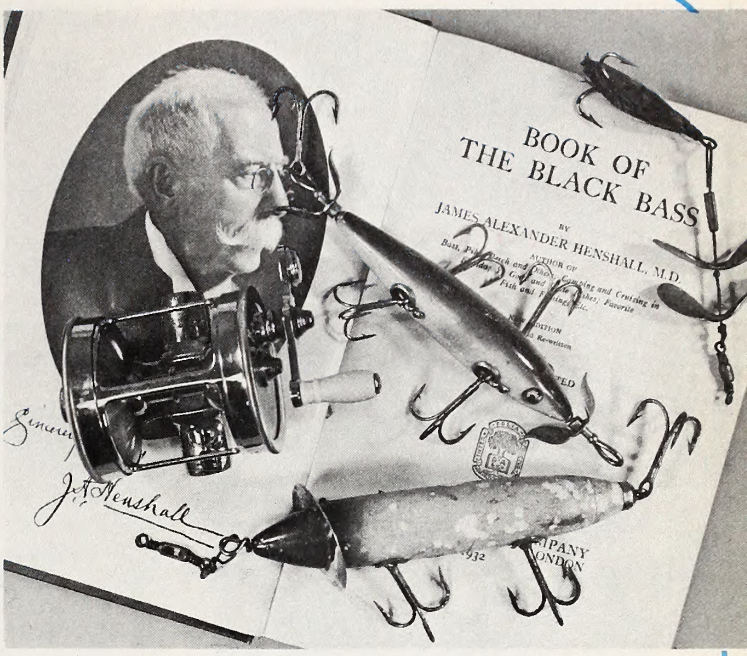
National Safe Boating Week

July 4-10 has been set aside this year as National Safe Boating Week. We hope that you'll observe it all year long on Tarheel waterways.

Father of Bass Fishing Disliked Plug Casters

FISHING

by Jim Dean



● Dr. James A. Henshall is rightly regarded as the father of bass fishing in this country, largely on the basis of his "Book Of The Black Bass" which was first published way back in 1881.

It is fascinating to read this book—now out of print—not only to see what bass fishing was like so many years ago, but also to observe the changes in bass fishing philosophy which have since occurred.

Most anglers are well acquainted with Henshall's landmark statement that "inch for inch and pond for pond, (the black bass is) the gamest fish that swims." Fewer have read the rest of that quote. Henshall added that "The royal salmon and the lordly trout must yield the palm to a black bass of equal weight. That he (the bass) will eventually become the leading gamefish of America is my oft-expressed opinion and firm belief."

Henshall's belief that bass are universally superior has been, and will continue to be, debated hotly among fishermen, but there is little doubt that Henshall helped bring the black bass (meaning both smallmouth and largemouth species) a proper measure of esteem. Indeed, time seems to be proving Henshall correct in his prophecy that the bass may become the nation's leading freshwater gamefish. Some enthusiasts say this has already happened in many areas, especially if you consider only major species and don't lump all the panfish into one big group. Others say the victory has been won by default since the trout doesn't have the range of the bass and the fabulous salmon runs of yesteryear are virtually gone.

Few would argue with Henshall's assertions that the bass is a superb gamefish which seems aptly suited to fish management. His range, size, durability, pugnacity and sporting qualities are well established, and all things considered, he can wear his crown proudly.

Yet, some of Dr. Henshall's observations are certain to come as a shock to the modern angler.

To me, the most interesting thing about Henshall's book is its unintentional insight into the changing philosophies of good sportsmanship. For those who do not already know, Henshall offers proof that such philosophies are nothing more than contrivance. In other words, fashion sets the standard of honor.

The best example is shown by Henshall's attitude toward fishing with artificial lures called plugs. Today, and for as far back as most of us can remember, the plug fisherman has been the epitome of good sportsmanship. When a bass fisherman graduates from what many consider the more lowly forms of natural bait fishing to the art of plug casting, he has arrived.

Yet, in Henshall's time, fishing with live bait and fly casting were the standards of honor while the plug fisherman was held in low regard.

Consider Henshall's dripping sarcasm in the following taken from the 1932 edition. "There are," writes Henshall, "at this present day of culture and refinement, a number of wooden nondescript monstrosities used in fishing, popularly known as 'plugs.' They are usually of an elliptical shape, and armed with from two to four cheap triangles or triple hooks, and with or without wings or propellers. They may be white, or painted with brilliant colors, and spotted, streaked, or striped. They are employed as casting baits, and swim or duck or dive, and wiggle and wabble, on or below the surface of the water.

"It is only fair to say, however, that they catch fish. They are used mostly by those who cast overhead with the short casting stick, called by courtesy a rod, and who consider fishing, not so much as a legitimate sport as a game, in which the fish has no chance whatever, being yanked or derricked out of its element in the shortest possible time."

It is abundantly clear that Dr. Henshall had little use for plug fishermen, and one must wonder what he would think of the present state of the art should he miraculously return to earth today and witness our modern methods.

I suppose my friends and I could take him by the hand and gently explain that it may take more skill to catch bass on plugs than on live bait, but I think I can predict his reaction.

"You, sir, are a cad," he would say.

At which point, someone would show him a tackle box full of nine-inch blue plastic worms and we'd all run. ▲▼

PHOTO BY LEONARD LEE RUE III

New Facts on the Carolina Chuck

by Frank Mooney

ANY animal that is revered enough to have a red-letter day on the calendar, wise enough to be known as a weather prophet, and important enough to have major arms companies manufacturing guns specifically for him, must have something going for him. To some, this appetite-on-four-legs is scarcely a friend.

For me this "non-game" animal has provided many exciting hours of off-season shooting. After a steady diet of fishing, any off-season plinking can do wonders for the itchy trigger finger.

The chuck is not truly a smart animal: however, after several contacts with man, he can become all eyes and brains. For example, one season when I approached downwind of a chuck hole. As I went over the crest of the hill I could see the critter feeding within feet of his den. The rascal was roughly 125 yards away and I kept the top of my head above the tall grass to mark his progress. I didn't stand a chance; that chuck was down its bolt hole before I could raise my rifle.

The Carolina woodchuck has not always been in the central Piedmont. To my knowledge, Robert Gentry, a farmer near Timberlake caught a young groundhog in 1958 and called the local wildlife protector to help identify it. In the same year in the adjoining county of Orange, several were released. Robert went on to say that it was two or three years later before groundhogs started eating his crops.

Several farmers in the adjoining county of Granville said that groundhogs and skunks were never a problem until the massive 50,000 acre impoundment known as Kerr Reservoir was flooded. It's understandable that animals in an area that extensive, had to go somewhere. And from my observations, there are more of these "pasture poodles" in Granville County which is near the lake than in Person County, where I live. So there's some logic to this explanation.

Its quite possible that some movement is related to the increase of this species. By the late 1960's, this animal had migrated south, east and west from its original mountain home. For some reason or other, this phenomenon has also happened in Virginia and Maryland. Some experts venture to say that this migration is possibly related to man's opening of once forested land and thus creating more "edge" for this animal. With the average life span of five years and a litter of four, it is sound reasoning that without some hunting pressure or control, they could easily spread into other areas. This newest varmint is not too choosy about his building site; he will dig a burrow along streambeds, hedgerows, old house sites, barns, rock piles, windrows, road banks, pine and hardwood forest, and even thickets and brushy areas.

One of the best ways to tell if the den is occupied is by seeing a fresh mound of dirt with flies hovering around the entrance. These flies differ from the common house fly; they're about the same size and look alike except that their wings are set out at a different angle. The common fly is seen around the den entrance too, but the other fly is usually more numerous.

Most of best chuck shooting is near farm houses which creates some safety problems but after scoring on a garden grabber one day I was talking to the farmer. "Real glad you killed the groundhog," the farmer said, "it was really doing my garden in. By the way, were you shooting a cannon?" After that trip I decided maybe the .243 did present a noise problem in a crowded community so I started checking around for a lighter rifle with a milder report yet powerful enough to anchor a garden-fed, heavy weight chuck. After a careful and exhaustive study, I settled on the little but mighty Remington 5MM magnum, model 592 with 10 shot capacity. This varminteer proved to be ideal for my type of chuck sniping.

This rim-fire, 38 grain hollow-point bullet is deadly accurate and with a 3 to 9 variable scope really fills my bill as a varmint gun where most of my shots are under one hundred yards. When I go to the western part of North Caroina where the steep mountains and open grassland call for longer shots, I take my .243 with 4X scope. These two guns leave little to be desired in the varmint line.

The tradition of the groundhog emerging from hibernation dates back many years. The old legend says the groundhog first came out of its burrow on Candlemas Day. Candlemas Day is an old church holiday always celebrated on the 2nd day of February by the lighting of candles.

In Europe the badger supposedly emerges from hibernation to check the weather and, according to folklore, when German pilgrims settled Pennsylvania they found no badgers and like most people that have deep roots and believe in a legend, they adopted the groundhog which also hibernates. Now their substitute was on his way to fame. In some parts of the country, Madison County, North Carolina included, the 14th of February is celebrated as the "true" day for the old weather prophet to make the scene. In fact, this date corresponds more with the study that I made last spring.

In June of 1973, *Wildlife In North Carolina* published an article of mine on groundhogs. A couple of weeks later I received a letter from Dr. David E. Davis, then head of North Carolina State University Zoology Dept., asking me to drop by his office in Raleigh and chat with him when I was next in town. He briefly stated in the letter about studying groundhogs for 13 years in Pennsylvania and wanting to find if the chuck did truly hiber-

nate in the south where temperatures were much warmer.

Friends of mine have seen chucks in December and January, so I was curious to know myself if the chuck did hibernate or maybe just sleep for several days during a cold spell. After an interesting talk with Dr. Davis, I decided to see if I could help solve the hibernation question of the Carolina chucks. Dr. Davis told me about the 13 year study of the Pennsylvania chucks. This study was conducted on a 600 acre plot. They used a very careful and complicated procedure. The earliest emergence of the groundhog was January 29 and the latest was February 9. According to this information their study is relatively close to the date set aside as Groundhog Day.

Dr. Davis also told me about comparing the Canadian groundhog to the ones in Pennsylvania—how they gained more weight and hibernated longer due to colder and much more severe weather. In this study they tried to determine the feasibility of harvesting woodchucks and their ability to increase their population. In one area they removed 70 percent of the July population; they noted that the natural mortality declined, the number of births increased and also many woodchucks moved in. For three years they continued to remove 70 percent of the animals and the number did not decrease; however, the average age did decrease.

This was fascinating to me as I knew this would be helpful in correlating with other studies on game animals where the hunter could harvest as many animals as nature warrants, without endangering the breeding stock. I was anxious to learn more about the chuck. How exciting it would be to participate in one of these studies.

The North Carolina groundhog (*Marmota monax monax*), is classified as the southern groundhog subspecies, where its range extends from Pennsylvania across to Iowa; from Alabama, Arkansas up into New Jersey and west to eastern Kansas. It is a member of the squirrel family of rodents and kin to the ground squirrels, western paririe dog and the eastern squirrel and chipmunk. At this writing, Dr. Davis is on study leave in California to find out more about the ground squirrel.

Last summer a good friend asked me to help thin out his chucks; they were using "squatters rights" on his vegetable garden, and he felt like they were picking more than their fair share. He told me where the dens were located, so late one afternoon I picked what I hoped to be a vantage point and waited patiently with the little 5MM magnum. The chuck had tunneled under an ancient barn with an old wagon parked under the shelter.

After glassing the area carefully I settled down to await the garden grabber. Shortly, a well-fed chuck climbed aboard the wagon for a look-see. The little 38 grain hollow-point did its job. Later I went to check another known chuck hole or two, and as I returned to pick up the dead one, I caught a grizzled old varmint flat-footed as it ate nearby. It was watching the farm house across the road and never knew what hit him.

A chuck's flat skull with small rounded ears and eyes near the top of its head were made to order for peering out of a den. It takes an expert marksman to consistently score on a nervous chuck that doesn't venture from its burrow but lies at the entrance. One hot, humid afternoon I scouted a cut-over clover field where two known chuck holes were located. When the field was first cut, one of the chucks vacated its den probably due to loss of cover and food. As I neared the old road leading to the clover field I noticed a fresh groundhog track in the mud leading toward the den. Maybe this old varmint had taken up housekeeping again since the clover has grown several inches.

Due to my over eagerness I let the chuck see me. It was lying at the den entrance, I slowly sank to the ground then crawled to the woods. The chuck was not sure of the object and continued to peer my way. After reaching the shadows of the trees I found a small opening to look through. As I squinted through the variable scope I knew the shot would have to be perfect to keep the clover-fed critter from dropping back into the burrow. As the crosshairs steadied on the chest, I squeezed the trigger. The chuck never moved from its tracks.

In one of the larger outdoor magazines I read where a hunter had shot an 18 pound groundhog. I had never weighed one and I was in for a big surprise when I checked the weight of several. I quickly found out that I couldn't be a success at guessing weight at a three ring circus. Dr. Davis ask me to compile some information of sex, weight, and date of kill. After toting a couple of chucks on a hot afternoon I could have sworn they were heavier than what the scales showed. The chucks that I weighed ranged between 7½ to 11 pounds. One mature male I told about shooting at the barn earlier in the article, tipped the scales at a surprising 7½ pounds.

The chucks around my home show partiality towards cabbage and bean vines, however, they relish alfalfa, grass, lettuce, potato, cantaloupe, and watermelon vines. Even tomato plants have been included in the last few years. One lady told me about a chuck that tunneled under her barn and enjoyed plums growing on a tree in the back yard. Fruit and berries, soybeans and peanuts, are some of the fodder that this appetite-on-four-legs consumes. Even bark from trees is included in their diet along with some animal matter.

This past January I was determined to see for myself if the groundhog did truly hibernate and, if it did, when it emerged from its winter sleep. On the 25th of January, I plugged several den openings and began daily trips to each site. Due to the energy crisis, sickness and work, I almost failed in my mission but with a little luck I gathered some information which was rewarding enough to warrant any hardship that occurred during this time. After a couple of weeks of daily checks I was beginning to wonder if they were active chuck holes or if someone had killed the occupants or maybe the chucks had moved to greener pastures.

Two sites were near prime garden spots so I set a trap at the entrance to make sure groundhogs emerged and not a skunk or opossum, plus do a favor for the farmers by ridding them of a garden pest. Finally, 9 days after Groundhog Day, the first chuck emerged. The temperature was in the 20's that night and only 39 degrees when I checked the den. This chuck weighed in at 8 1/4 pounds, bright eyed and bushy tailed. Nothing else stirred until the 17th then the other groundhog made his debut. He left nothing but hair in the sprung trap as mute evidence of his passing. Due to back problems I was unable to continue my checking, however, I was well pleased with the results.

There is still much more to learn about the Carolina chuck but at least the stage has been set. ▲▼

Stem to Stern

BY ED JENKINS

PHOTOS BY ED JENKINS

Competitive white water events such as this one held on the Nantahala River near Wesser, N. C., give teams a real opportunity to test their skills. These events are well organized and prepared for the many spills to come.

A jarring collision with a boulder separates another man and his craft (above). The man has moved upstream of his canoe to avoid possible injury and grabs a safety rope thrown to him. The importance of not being trapped downstream of a canoe is seen below. The force of the river holding this canoe against a boulder is too great for all of these people to overcome and could easily crush a man to death.

• Whitewater canoeing has experienced a tremendous growth in popularity during the past few years. The canoeing fever, kindled by the popular movie "Deliverance," has drawn persons of all ages and from all walks of life to the white frothy waters in search of fun and adventure.

The following information is reprinted from the Texas Parks and Wildlife Department brochure *Whitewater!*. This information is not offered as a self-teaching course in whitewater canoeing, but rather as supplemental information necessary to a safe canoeing trip. As in any active sport, there is a certain amount of danger involved in whitewater canoeing, and one should not attempt this sport before receiving instruction from an experienced whitewater canoeist.

I. PERSONAL PREPAREDNESS AND RESPONSIBILITY

1. Be a competent swimmer with ability to handle yourself underwater.
2. Wear a life jacket.
3. Keep your craft under control. Control must be good enough at all times to stop or reach shore before you reach any danger. Do not enter a rapid unless you are reasonably sure you can safely navigate it or swim the entire rapid in event of capsizing.
4. BE AWARE OF RIVER HAZARDS AND AVOID THEM. Following are the most frequent KILLERS.
   A. HIGH WATER. The river's power and danger, and the difficulty of rescue increase tremendously as the flow rate increases. It is often misleading to judge river level at the put in. Look at a narrow, criticial passage. Could a sudden rise from sun on a snow pack, rain, or a dam release occur on your trip?
   B. COLD. Cold quickly robs your strength, along with your will and ability to save yourself. Dress to protect yourself from cold water and weather extremes. When the water temperature is less than 50 degrees F., a diver's wetsuit is essential for safety in event of an upset. Next best is wool clothing under a windproof outer garment such as a splash-proof nylon shell; in this case you should also carry matches and a complete change of clothes in a waterproof package. If, after prolonged exposure, a person experiences uncontrollable shaking or has difficulty talking and moving, he must be warmed immediately by whatever means available.

No panic here. This experienced canoeist is keeping his feet before him to fend off rocks as he works his way toward shore.

C. STRAINERS: Brush, fallen trees, bridge pilings, or anything else which allows river current to sweep through but pins boat and boater against the obstacle. The water pressure on anything trapped this way is overwhelming, and there may be little or no whitewater to warn of danger.

D. WEIRS, REVERSALS, AND SOUSE HOLES. The water drops over an obstacle such as a low water dam or natural falls, then curls back on itself in a stationary wave. The surface is actually going UPSTREAM, and this action will trap any floating object between the drop and the wave. Once trapped, a swimmer's only hope is to dive below the surface where current is flowing downstream or try to swim out the end of the wave.

5. Boating alone is not recommended. The preferred minimum is three craft.
6. Have a frank knowledge of your boating ability. Don't attempt waters beyond this ability. Learn paddling skills and teamwork, if in a multiple-manned craft, to match the river you plan to boat.
7. Be in good physical condition consistent with the difficulties that may be expected.
8. Be practiced in escape from an overturned craft, in self-rescue, and in artificial respiration. Know first aid.
9. The Eskimo roll should be mastered by kayakers and canoers planning to run large rivers and/or rivers with continuous rapids where a swimmer would have trouble reaching shore.
10. Wear a crash helmet where an upset is likely. This is essential in a kayak or covered canoe.
11. Be suitably equipped. Wear shoes that will protect your feet during a bad swim or a walk for help, yet will not interfere with swimming (tennis shoes recommended). Carry a knife and waterproof matches. If you need eyeglasses, tie them on and carry a spare pair. Do not wear bulky clothing that will interfere with your swimming when waterlogged.

II. BOAT AND EQUIPMENT PREPAREDNESS

1. Test new and unfamiliar equipment before relying on it for difficult runs.
2. Be sure craft is in good repair before starting a trip. Eliminate sharp projections that could cause injury during a swim.
3. Inflatable craft should have multiple air chambers and should be test-inflated before starting a trip.
4. Have strong, adequately sized paddles or oars for controlling the craft and carry sufficient spares for the length of the trip.
5. Install flotation devices in non-inflatable craft, securely fixed, and designed to displace as much water from the craft as possible.
6. Be certain there is absolutely nothing to cause entanglement when coming free from an upset craft; i.e., a spray skirt that won't release or tangles around legs; life jacket buckles, or clothing that might snag; canoe seats that lock on shoe heels; foot braces that fail or allow feet to jam under them; flexible decks that collapse on boaters' legs when a kayak is trapped by water pressure; baggage that dangles in an upset; loose rope in the craft, or badly secured bow/stern lines.
7. Provide ropes to allow you to hold onto your craft in case of upset, and so that it may be rescued. Following are the recommended methods.
   A. Kayak and covered canoes should have six-inch diameter grab loops of 1/4 inch rope attached to bow and stern. A stern painter seven or eight feet long is optional and may be used if properly secured to prevent entanglement.
   B. Open canoes should have bow and stern lines (painters) securely attached consisting of eight to 10 feet of 1/4- or 3/8-inch rope. These lines must be secured in such a way that they will not come loose accidentally and entangle the boaters during a swim, yet they must be ready for immediate use during an emergency. Attached balls, floats, and knots are not recommended.
   C. Rafts and dories should have taut perimeter grab lines threaded through the loops usually provided.
8. Respect rules for craft capacity and know how these capacities should be reduced for whitewater use. (Life raft ratings must generally be halved.)
9. Carry appropriate repair materials: tape (heating duct tape) for short trips, complete repair kit for wilderness trips.
10. Car top racks must be strong and positively attached to the vehicle, and each boat must be tied to each rack. In addition, each end of each boat should be tied to car bumper. Suction cup racks are poor. The entire arrangement should be able to withstand all but the most violent vehicle accident.

III. LEADER'S PREPAREDNESS AND RESPONSIBILITY

1. River conditions. Have a reasonable knowledge of the difficult parts of the run; or, if an exploratory trip, examine maps to estimate the feasibility of the run. Be aware of possible rapid changes in river level, and how these changes can affect the difficulty of the run. If impor-

• **continued on page 27**

One Good Turn Deserves Another

by Lew Bosworth
Wilmington

OCCASIONALLY, selfish, money-hungry man inadvertently does something to benefit nature. The giant Royal Tern nursery in the lower Cape Fear River, just a few miles from bustling Wilmington, is one such example.

In a way, nature herself initiated this good fortune. Over a period of time, sand and silt from the 'up country' streams finally filtered out and settled in the lower Cape Fear River, clogging the channel and threatening to strangle shipping life at the Port of Wilmington. To combat this, dredging operations, under the direction of the U.S. Army Corps of Engineers, began in the 1940's to deepen the channel. The most sensible and easily accessible area to dump these dredgings was along the shallow portions of the river, between the channel and the shore. Thus fifteen to twenty dredge islands came into being.

No one could possibly have known then that one of these areas of waste, an island 125' by 300' and four feet above mean high tide would eventually provide the setting for the dynamic panorama of birth during the late 1950's and early 1960's. This island in par-

PHOTO BY B. LEE

The royal tern, a good sized bird with a wing span of some two feet, nests in colonies, usually on a fairly isolated sand island or similar situation. As with many birds, including gamebirds, nesting areas are dwindling. This story, however, is a reversal of that trend.

ticular, because it was void of vegetation.

The Royal Tern is the second largest member of the tern family, with a wing span of 22-28 inches, a bright orange bill and, during breeding season, a distinguishing black crest which stretches from the top of its head down to its beak. It has a slim, streamlined body with a short, forked tail and flies with its bill extended outward, parallel to its body like a gull, rather than downward, perpendicular to its body like most of the other members of the tern family.

This species is not new to New Hanover County. Prior to 1900 its members widely nested in this warm, gentle climate. Because of its nesting habits, it fell easy prey not only to natural enemies which the balance of nature took care of, but to its worst unnatural enemy—man. Eggs were gathered by the thousands to be shipped, sold and eaten and the birds themselves, a delectable treat, were decimated as they sat on their nests or flocked, hovering above the nesting area. They were easy to kill—one shotgun blast could net a dozen or more. Their numbers dwindled and finally they vacated this hostile area for more seclusion and safety.

Imagine a couple of terns flying over the area in the late 1950's and saying: "Get a load of that new island down there."

"Yeah, and nothing on it but sand."

"Let's discuss it with the group this winter and see what they think."

"Look like its got everything. Near the water, plenty of food nearby, lots of sun and that horrible two legged creature doesn't seem to be around."

Fantasy? Perhaps. Nevertheless, once again the terns began nesting in this area. The island has become a permanent nesting ground and recently there were more than 2,000 pairs of birds enjoying its hospitality.

After a winter vacation in Brazil and Venezuela, the first birds, 45 to 50 pairs, arrive about the first of May. They frolic and cavort about for a week or two and then settle down to the serious business of raising a family. The hen squats on the open sand and wiggles and squirms until she forms a slight depression which feels right to her. Her territory encompasses all the land around her which she can reach with her bill, without getting off the nest. She will tolerate no intrusion of her area. She will then lay one or possibly two eggs; one nest in sixteen has two eggs. After the eggs are laid, both hen and cock share the responsibility of incubation which takes from 30 to 35 days.

Up until the middle of June, 45 to 50 additional pairs of birds join the colony every day or so. The first arrivals choose the prime real estate at the top of the island while each succeeding arrival picks what is left, towards the river, until the latecomers are forced to settle on the least desirable water front lots. The prime disadvantage of the water front property is the danger from an extremely high tide which can cover the nest and the eggs. Once an egg is submerged in water it will not hatch. However, the undaunted tern will, if the egg has been recently laid, reproduce another to replace it.

This relatively small and graceful bird lays an egg which is approximately 63 by 44.5 millimeters. The eggs are a light cream colored background with a dark brown spatter pattern which is different on each egg and which is caused by the egg moving down from the ovary. The egg, in relation to the bird, is gigantic and what a relief it would be if mama could only say "ouch."

Because of the island's location, natural predators—snakes, rats and raccoons—are absent. There is one principal predator, however, the gull, which thoroughly enjoys tern eggs. The flock, when invaded by an unwary gull, will react in unison, viciously attacking the invader and often pecking it to death.

The chicks, when hatched, remain in the nest for only 3-4 days. Then they flock together and remain in their own little group. Both hen and cock procure food for them and they are fed on the hungriest first basis, a truly communal system.

By the end of June—mid-July at the latest—the island is again an empty patch of sand in the Cape Fear River, waiting for next year's exciting, awesome experience of teeming new life.

Witnessing this nursery is an unforgettable experience. Approaching the island, the birds appear like a thousand, neatly placed decoys. Coming closer, the ones nearest will rise into the air and scream warning. Once foot is set on the island, the entire colony takes to the air and hovers, darts and dives above the invader with frantic, flapping wings, raucous screeching and flashing orange beaks. Recalling Alfred Hitchcock's film. "The Birds," tempts one to flee in panic. But, remember, these terns stand in awe of man and are bluffers "par excellence." After all, maybe they do know somehow that it was the two legged creature who gave them their new nursery. ⬍

The Yellow-billed Cuckoo

PHOTOS BY THE AUTHOR

by Mrs. Grace S. Draper
Pleasant Garden

The yellow-billed cuckoo is heard much more frequently than it is seen. Observing a nest of young is certainly a rare experience.

• A summer resident, often heard but seldom seen in his favorite domain—the tall treetops—is the handsome yellow-billed cuckoo.

Old-timers have listened to his coarse "ka-ka-ka-ka-cow-cow-cowp-cowp"—the latter syllables accentuated very slowly and deliberately—and have called him a "rain crow." (Another bird labelled with the same name is the familiar mourning dove.) The cuckoo's call is so unusual that many do not recognize it as belonging to this bird. And certainly it is a bird that one does not see to associate it with this call because of its shyness and secretiveness. The cuckoo is a slender, light brown bird, approximately 12 inches in length, with russet wings and black/white tipped feathers in its long tail. This unusual tail identifies the bird as it flies overhead for the spotted coloration pattern is most apparent from below when the bird spreads its tail feathers. The long curved beak, with a yellow lower mandible, is responsible for its name.

At our farm we have occasionally spotted the cuckoo each summer in its rapid flights through the tall oaks and walnuts in our yard, and we have often heard him render the distinctive call. A summer or two ago we were privileged many times to see him visit the two young catalpa trees, where he proceeded to help himself to the fat black and white catapla worms busily devouring the catalpa leaves! By September, the myriad supply of somebody's fishing bait had completely disappeared, and the trees were, as usual, beginning to grow a new supply of leaves (just in time to shed them in the impending winter winds). The cuckoo is one of the few birds that will consume the hairy caterpillar pests which cause so much damage to fruit and ornamental trees—this bird is a real friend to the farmer and gardener.

So it was with a great deal of astonishment that we accidentally discovered a cuckoo nest in a small winged elm tree in a seldom visited and heavily overgrown field below our barn this year. The nest was found late in August; it was built of coarse sticks and twigs laid in a loose platform arrangement and quite shallow. It was lined with skeletonized leaves, matted down to be slightly soft. There the cuckoo had laid four pale blue eggs, approximately one inch long and almost round. Three eggs hatched into most unattractive, charcoal-colored young with black curved beaks who rapidly grew porcupine-like feather sheaths, giving them a very formidable appearance! (Cuckoo babies have been called "infant dragons.")

For one who had become accustomed to maintaining growth records on tiny baby chickadees and pretty little bluebirds, these large and different-looking cuckoo babies presented a new experience for me! Needless to say, their growth was observed with a great deal of interest. As predicted by the National Geographic's description of the yellow-billed cuckoo* when approximately a week old, these feather sheaths split, revealing fully developed dark grey feathers, and transforming the babies into most appealing and very presentable short-tailed cuckoos with long curved beaks. The three completely filled the nest.

The alert parent bird always promptly and noiselessly disappeared into trees nearby each time we approached the nest, and we never did actually see her feeding the babies. However, the well-fed young grew rapidly; the two older babies left the nest on the twelfth day, the third left the following day, which happened to be a cold and dreary one. At dusk the new fledgling was calmly sitting in a little sweet gum tree, only a few feet from the ground. His mother bird could be heard in the top of the tulip tree rendering a muted "ka-ka-ka-ka." At this late date, these baby cuckoos must mature rapidly in order to be able to join their parents and other relatives for the long trip to Central and South America, where they spend the winter.

The yellow-billed cuckoo belongs to a family of 127 species distributed throughout the tropical and temperate regions of the world. Most of them are forest birds, with insects being their preferred food, notably the hairy caterpillars. Most of the cuckoos are parasitic in nature, laying eggs in other birds' nests and allowing the foster parents to rear their young. However, the species found in our general area, the yellow-billed and black-billed cuckoos, are **not** parasitic: they build their own nests and raise their own families.

The cuckoo received its name from the European common cuckoo, the only one that distinctly repeats its name as the cuckoo clock imitates it. Included in the cuckoo family is the road-runner of the west (known as a ground cuckoo), famous for its 15-mile-per-hour sprints across the desert, as well as its comical antics and its bouts with rattlesnakes. ◆

**Water, Prey and Game Birds of North America,* National Geographic Society (1965), pp. 424-427.

The Garter Snake

by Nell Lewis
Greensboro

"IGNORANCE is bliss" is one adage that has little, if any, meaning; what can be more destructive than ignorance! As I once again shared my garden with a quiet, unobtrusive garter snake, I remembered with shame and regret that in earlier years I more than likely would have chopped her head off with a hoe, simply because I had never taken time to count her worth, nor yet considered her rights as an earth creature.

This is the third summer that the greenish snake with the three light stripes lengthwise her body has sunned along the candytuft border, sometimes stretching straight her full twenty-nine inches. Her identity is unmistakable; she has lost the tip of her tail, but the bluntness in no way detracts from her beauty.

I have dealt gently with (and walked gingerly around!) her and she does not object to my presence. Occasionally she raises her head, flicks her tongue, and gazes at me with a cold, calculating stare that admittedly chills my spine; I respect her right to exist but stand in awe of her deadly silence! She trusts only the solitude of the two of us; she oozes quickly away when a second or third person crowds her domain.

Snakes reportedly have no eyelids and according to the World Book Encyclopedia "the eyes are protected by a transparent cap that is shed with the skin. This cap keeps a snake's eyes always open, which makes it impossible to prove scientifically that a snake sleeps."

Be that as it may, my garter snake often has a blue-green "lid" covering the eyes, giving her a pathetic, blind appearance. I have watched intently, once for almost thirty minutes, in an effort to determine if the transparent cap was simply reflecting the blue of the sky, but it remained the same, in sunshine and shadows, and the layman, with no scientific proof, can only relate what he knows he sees. The "lid" suddenly disappears although the snake has not moved nor have the shadows altered.

Having only meager knowledge of herpetology, my assumption that this snake is a female could be in error, but all signs indicate that possibility. Each year a second garter snake, shorter and more slender, has been noted briefly early in the season. And the blunt-tailed one follows a pattern; she grows fatter and lazier and then fails to come to her resting place for several days. When she returns she is slimmer and more active.

The garter snake, estimated to be the most numerous and most widely distributed of all American snakes, gives birth to live babies, rather than depositing eggs as does the reptile. The litter varies from fifteen to thirty, though larger numbers have been recorded. And from birth, they are on their own, unattended by the parent. Their diet will include other cold-blooded animals such as frogs and fishes.

Snakes are probably the most unjustly maligned creatures we have. "Of some 2400 kinds of snakes that are known, about 60 occur in the Eastern United States. Of the latter, only eight may be classed as venomous and dangerous to man, and other animals." (Poisonous Snakes of the Eastern United States, by Harry T. Davis). Due to those eight, we are prone to kill any and all snakes that we might encounter. And that, without qualification, is ignorance.

It is difficult to explain our aversion to even the harmless ones. Since the time of Adam and Eve snakes have been worshiped as gods, looked upon as evil spirits to be avoided, and dedicated to Aesculapius, the god of medicine. There are few enthusiastic "snake handlers," and many who say they hate them but are nonetheless irresistibly drawn to view caged ones. Perhaps it is their ability to move swiftly and so silently that causes our distrust of them; or could it be the cold deadly stare of their unblinking eye!

We have come a long way in our dedication to the conservation/preservation of the life on our planet but we have not yet attained, and may never attain, full knowledge of its importance and in its entirety. Surely there is a vital purpose in the scheme of nature for all creatures, from the microscopic to the monstrous, providing each has the benefit of its natural controlling force.

Over the last decade, especially, man has begun to shudder over the fact that perhaps he, in his effort to control all things, may have erred dangerously, and to compound his fear, he cannot pinpoint where the danger lurks!

Faced now with this dilemma we can only tread softly and trust that we have not gone too far afield to find our way back to safety. And so it is, now, with a deeper appreciation that I recognize the very probable worth of all living beings—and tolerate the garter snake that chose my flowers as her dwelling place.

Who knows—one day I might gain courage to hold her cool, dry, harmless body and overcome my primitive fear of her!

- Letters
- Comments
- This & That

BACK OF THE BOOK

Legal Barrels

Dear Sir:

I enjoyed the article, "Open that Barrel for more Birds," by Gerald Almy in your February 1976 issue. However, I believe Mr. Almy should have cautioned his readers against cutting off the barrels of their firearms beyond the limitations prescribed by law.

For shotguns, the barrel length must remain greater than 18 inches and the overall length of the weapon must exceed 26 inches. For rifles, the barrel length must remain greater than 16 inches and the overall length more than 26 inches. Anything short of these measurements could subject the experimenter to the criminal penalties involved, in addition to the tax liability of $200 for manufacturing an illegal weapon (sawed off shotgun or short barreled rifle).

Mr. Almy didn't point out that the optimum barrel length for single shot and double barrel shotguns is about 24 inches. I just feel that your readers should be made aware of the legal minimums before they find (the hard way) that this "low cost" way of creating a good bird gun could become very expensive.

Persons interested in obtaining further information along these lines should contact their local Police Department or the nearest office of the Treasury Department's Bureau of Alchol, Tobacco and Fire arms.

Sincerely,
Wayne Miller,
Springfield, Virginia

Environmental Specialist Appointed

Lawrence E. Clark of Raleigh has been promoted to the new position of environmental specialist for the Soil Conservation Service in North Carolina, it was announced recently by State Conservationist Jesse L. Hicks.

Although selected for the job from a national panel of applicants, Lawrence Clark is already with the SCS in Raleigh. He has served since 1968 as an agricultural economist on the River Basin-Watershed Planning Staff.

In his new position he will coordinate environmental aspects of a variety of SCS activities, Jesse Hicks said. "I'm glad that we can appoint a man with Larry Clark's high professional standards, since this is a key aspect of the conservation programs we deal with."

New Conservation Poster Offered for Sale

Excited birdwatchers are witness to a wildlife scene that's alive with over two dozen birds, mammals, and fish on the latest U.S. Fish and Wildlife Service poster promoting the sale of duck stamps to everyone interested in wildlife conservation.

The loss of living space is the greatest threat to wildlife today. Revenue from the sale of these stamps buys land and sets it aside for wildlife.

The 28"x42" full-color poster is being offered for sale to the public at $1.80 through the Government Printing Office. Copies may be obtained at all GPO bookstores or by writing to the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402, for poster #024-010-00410-0.

Hunter Safety Program Award

The Hunter Safety Program of the North Carolina Wildlife Resources Commission recently received another honor.

The Wildlife Commission received a handsome plaque from the National Rifle Association for its outstanding contribution to the Firearm and Hunter Safety Education Program. North Carolina was picked in the top ten in the United States and Canada for its achievement during the 1974-1975 fiscal year.

We are now certifying some 30,000 students annually with quality instruction. Even though we have made tremendous progress, we still have a long way to go to reach our goal, which is to make the program available to every North Carolinian interested in firearm and hunter safety education and to cut down on accidents that occur each hunting season from the careless use of weapons.

C. J. Overton, Jr.

National Hunting & Fishing Day September 25, 1976

INDIVIDUAL SPORTSMEN IMPORTANT TO INCREASED NHF DAY SUCCESS

by Bob Delfay

Sportsmen need not belong to an organized rod and gun club or conservation group in order to help promote National Hunting and Fishing Day. There are many things which the individual hunter or fisherman can do on his own to help spread the word about NHF Day.

There are 55 million hunters and fishermen in America according to NHF Day headquarters in Riverside, Conn. All are honored by National Hunting and Fishing Day and all should do their part in helping to make the day a success. For only $2.00 a sportsman can obtain 500 colorful National Hunting and Fishing Day stickers to use on his mail at home and in the office and to give to his hunting friends so they can do likewise. For only $1.00 he can obtain five NHF Day bumper stickers for his car, camper, business vehicle, etc.

If there has never been an NHF Day program in a town, it only takes one sportsman to order an NHF Day aids kit for $3.00 and start the organizational ball rolling for the first time in his community. Many excellent programs have been started in exactly this way.

Most important, every sportsman should plan to attend the NHF Day activities in his area on September 25 and to take at least one non-sportsman friend. If every hunter or fisherman took a friend to an NHF Day program more than half the nation would be involved in NHF Day activities come September 25.

The above mentioned materials, plus additional information on NHF Day, are available from NHF Day, 1075 Post Road, Riverside, Conn. 06878.

• **STEM TO STERN from page 21**

tant, determine approximate flow rate or level. If trip involves important tidal currents, secure tide information.

2. Participants. Inform participants of expected river conditions and determine if the prospective boaters are qualified for the trip. All decisions should be based on group safety and comfort. Difficult decisions on the participation of marginal boaters must be based on total group strength.
3. Equipment. Plan so that all necessary group equipment is present on the trip; 50 to 100-foot throwing rope, first-aid kit with fresh and adequate supplies, extra paddles, repair materials, and survival equipment if appropriate. Check equipment as necessary at the put in, especially life jackets, boat flotation, and any items that could prevent complete escape from the boat in case of an upset.
4. Organization. Remind each member of individual responsibility in keeping group compact and intact between leader and sweep (capable rear boater). If group is too large, divide into smaller groups, each of appropriate boating strength, and designate group leaders and sweeps.
5. Float plan. If trip is into a wilderness area, or for an extended period, your plans should be filed with appropriate authorities, or left with someone who will contact them after a certain time. Establishment of checkpoints along the way at which civilization could be contacted if necessary should be considered. Knowing location of possible help could speed rescue in any case.

IV. IN CASE OF UPSET

1. Evacuate your boat immediately if there is imminent danger of being trapped against logs, brush, or any other form of strainer.
2. Recover with an Eskimo roll if possible.
3. If you swim, hold onto your craft. It has much flotation and is easy for rescuers to spot. Get to the upstream end so craft cannot crush you against obstacles.
4. Release your craft if this improves your safety. If rescue is not imminent and water is numbing cold, or if worse rapids follow, then strike out for the nearest shore.
5. Extend your feet downstream when swimming rapids to fend against rocks. Look ahead. Avoid possible entrapment situations: rock wedges, fissures, strainers, brush, logs, weirs, reversals, and souse holes. Watch for eddies and slackwater so that you can be ready to use these when you approach. Use every opportunity to work your way toward shore.
6. If others spill, go after the boaters. Rescue boats and equipment only if this can be done safely.

V. INTERNATIONAL SCALE OF RIVER DIFFICULTY

(If rapids on a river generally fit into one of the following classifications, but the water temperature is below 50 degrees F., or if the trip is an extended trip in a wilderness area, the river should be considered one class more difficult than normal.)

CLASS I. Moving water with a few riffles and small waves. Few or no obstructions.

CLASS II. Easy rapids with waves up to three feet, and wide, clear channels that are obvious without scouting. Some maneuvering is required.

CLASS III. Rapids with high, irregular waves often capable of swamping an open canoe. Narrow passages that often require complex maneuvering. May require scouting from shore.

CLASS IV. Long, difficult rapids with contricted passages that often require precise maneuvering in very turbulent waters. Scouting from shore is often necessary, and conditions make rescue difficult. Generally not possible for open canoes. Boaters in covered canoes and kayaks should be able to Eskimo roll.

CLASS V. Extremely difficult, long, and very violent rapids with highly congested routes which nearly always must be scouted from shore. Rescue conditions are difficult and there is significant hazard to life in event of a mishap. Ability to Eskimo roll is essential for kayaks and canoes.

CLASS VI. Difficulties of Class V carried to the extreme of navigability. Nearly impossible and very dangerous. For teams of experts, only, after close study and with all precautions taken. ▲▼

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PHOTO BY KARL MASLOWSKI

Scarlet Tanager in Black Oak

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Wildlife

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An objective of all levels of government should be to achieve and sustain a balance of the social, ecological, and economic benefits derived from natural resources. Without such balance none of the factors on the scale will be worth weighing.

Much of this issue is devoted to non-game and endangered wildlife, and the new Carolina Conservationist program (page 15.) This month's cover portrays the red-cockaded woodpecker (male at left) in a typical resin-dripping pine tree. A story featuring recent developments in the management of this scarce bird is found on page 16. Cover painting by Duane Raver.

PHOTO BY F. EUGENE HESTER

Finding Out

The natural world contains many things to ponder and wonder about; many things that we should know about. To those willing to search, go answers that mankind must have.

Newly hatched pelicans are black, helpless, almost shapeless blobs (above). In less than a month, the infants take on a much more pelican-like stature (below).

The Brown Pelican – an Endangered Species

by James F. Parnell
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Photos by the Authors

"A wonderful bird is the pelican;" so wrote Dixon Lanier Merritt in 1910, and we all know the next line, whether we've seen a pelican or not. The brown pelican (*Pelecanus occidentalis*) is one of the best known of our native birds and is a popular part of the lore of the South.

The brown pelican is one of the largest seabirds seen along North American coasts and waterways. It is both ungainly and spectacular, and always arouses interest. Seeing a brown pelican is not as common, however, as it once was; these great birds are having difficult times, and their numbers in many areas have been greatly reduced.

The range of the brown pelican is extensive. It may be found along Pacific, Gulf, and Atlantic coasts of North America and it may also be found along the entire west coast of South America, throughout the Caribbean, and down the Atlantic coast of South America to the mouth of the Amazon River. In North America brown pelicans nest in colonies on the California coast, along the Gulf coast, and up the Atlantic coast as far as North Carolina.

Individuals or small flocks of brown pelicans may be found along the North Carolina coast at any season. However, a small nesting colony in Pamlico Sound near Ocracoke Inlet is the only breeding site in North Carolina and is the most northern colony known.

Throughout its range the brown pelican is associated with salt water and is seldom seen away from the immediate coast. They are commonly seen patrolling the beach in small flocks, or perched on pilings around docks and coastal channel markers. Their food consists primarily of fish. They feed either by diving head first for fish spotted from the air or by thrusting the head below the surface while sitting on the water.

Appearing awkward when diving, the pelican is actually a well-coordinated fisherman. At the moment of impact with the water the head is thrust downward and the pouch distended to make a large dip net. Fish and two or three gallons of water are dipped. The bird then raises its head with bill pointing downward. Water is thus drained away, and the fish dinner is retained. Contrary to the established lore on pelicans, the fish is not carried in the pouch but is swallowed immediately.

Since fish are located by sight, pelicans can only feed in relatively clear water, and generally will not be found in areas where water is constantly muddy. One theory indicates that this factor may be responsible for brown pelicans not occurring south of the Amazon River on the Atlantic coast of South America, whereas they occur much further south on the Pacific coast. A wide band of constantly muddy water at the mouth of the Amazon appears to act as a barrier to the pelicans. Water turbidity may also affect local distribution along the North Carolina coast.

Brown pelicans generally feed on fish that school near the surface. Studies indicate that along the southeast Atlantic coast, menhaden

This colony of nesting pelicans has selected a shrubby coastal island for the stick platform nests. The young shown below (left) are almost as large as the parent birds, but adult plumage is months away and maturity almost two years away.

is the most important food species, often representing 95 percent of the bird's diet.

Brown pelicans nest on sandy or shrubby isolated coastal islands. They build either large stick platform nests in the tops of dense shrubs or low trees, or mounds of sticks, mud, and debris on the ground. In the North Carolina colony, nests are usually on the ground, although we have seen a few elevated nests in low shrubs. One to three dirty white or brownish eggs are laid sometime between early April and late July in the North Carolina colony. Both parents share incubation for about four weeks.

The newly hatched pelicans are black, helpless blobs that only another pelican could love. They attain a dense coat of white down by about two weeks of age and become more presentable. They leave the nest at about five weeks of age, if nesting on the ground; they then gather in groups along the island beaches. The parents continue to bring food until the young birds attain the capability of flight at about nine weeks. Brown pelicans do not reach maturity until about two years of age.

Brown pelicans were once abundant along the coasts of North America, but they have come upon hard times in recent years. By the 1960's, reproductive success was dropping alarmingly in California nesting colonies. In Gulf coast colonies the first hint of trouble came in 1956. By 1962 no brown pelicans nested in Louisiana, the Pelican State, the traditional site of most Gulf coast colonies.

Scientific studies showed that brown pelicans were laying eggs with very thin shells, eggs which often broke during incubation. In some cases embryos failed to develop, and occasionally there were even die-offs of adult birds. The culprits were primarily a group of chemicals known as chlorinated hydrocarbons which are commonly used in pesticide manufacture.

Residues from these pesticides have been accumulating in the waters of the world due to heavy use of such chemicals as DDT during World War II and the post war period. These chemicals are taken into the bodies of small aquatic organisms and are concentrated as they moved up the food chains. Pelicans and other fish-eating birds concentrated these residues in such large amounts as to damage their eggshell producing mechanism, or in some cases to poison the birds themselves.

Fortunately the use of chlorinated hydrocarbon based pesticides has been much reduced, with many specific poisons removed from the market. By the early 1970's the effect of lessened amounts of these poisons in the environment was becoming evident.

In California where the population had not been completely eliminated, reproductive success is improving. Beginning in 1968 in Louisiana, where all pelicans had disappeared, young birds were imported from Florida in an effort to re-establish the species. By 1971 a few of these birds were nesting; but there have been subsequent die-offs; and the success of this operation is still inconclusive. Efforts continue, however, to re-establish brown pelicans in the Pelican State.

Florida colonies appear to have escaped the worst of the pesticide-induced reproductive failures, but eggshell thinning has been found in some Florida pelicans. In South Carolina there has been a gradual reduction of production of young birds, and eggshell thinning is occurring.

The U. S. Fish and Wildlife Service has estimated that populations of brown pelicans totaled more than 95,000 along the Atlantic and Gulf coasts prior to this population reduction. They estimate that only about 20,000 to 25,000 birds remain.

Small flocks of brown pelicans may be seen at any location along the North Carolina coast. Most of these are immature birds that have

wandered north from nesting colonies further south. They will eventually return southward to nest at traditional sites in South Carolina and Florida. Reports of such flocks of brown pelicans often lead to speculation that nesting is occurring, but the only nesting colony known to have existed in North Carolina is the Pamlico Sound colony.

This colony was apparently first discovered in 1929 by a Federal conservation agent named William L. Birsch. He found 14 pairs of pelicans nesting on Royal Shoal about eight to 10 miles northwest of Ocracoke Inlet in Pamlico Sound. The details of the subsequent history of this colony are unclear. The next report was not until 1947 when Bob Wolff found 14 occupied and several empty nests on Shell Island (also called Castle Rock) in Pamlico Sound between Ocracoke and Portsmouth Islands. Royal Shoal had apparently eroded away in the years since 1929 and the birds had moved a few miles to the new site. Whether this colony had nested regularly between 1929 and 1947 is unknown. They likely nested each year on one of the several small islands in that region but were not found by persons interested in recording their presence.

No evidence of nesting pelicans was found in 1948 although about 200 adults were seen in the vicinity by A. D. Shaftesbury. There isn't another break in the history of this colony until 1957 when Robert Wolff again visited the site. He found 35 nests, 87 immature birds and 102 adults. Since 1957 the pelicans appear to have nested regularly either on Shell Island or North Rock Island, both small low islands in Ocracoke Inlet. Differences in the use of island names often makes it unclear which island was used in a given year. The colony has been visited by the authors annually since 1972 as a part of Sea Grant supported research on coastal bird populations. The table indicates the reported numbers of nests, juveniles, and adults seen on each visit, since the discovery of the colony.

It appears from this sketchy record that since the late 1950's, production has been relatively stable. While annual fluctuations have occurred there has been no dramatic decline; in fact, it appears that the population may be growing slightly. Perhaps this colony, located in an isolated site, away from any large river laden with the residues of agricultural chemicals has escaped the problems of colonies elsewhere. It should be obvious, however, that we need to know more about the breeding biology of our brown pelicans. An occasional visit and brief sketchy reports have not given us the information on reproductive success that we need for proper evaluation of the health of this northernmost colony.

Considerable recent interest has been shown in the well-being of the brown pelican. It has been placed on the endangered species list, both federally and in North Carolina. More recently the U. S. Fish and Wildlife Service has appointed a recovery team of federal, state and private bird experts to assist this magnificent bird to regain its former status as an important member of coastal ecosystems in the south. While the future for the North Carolina pelicans does not appear as bleak as that of brown pelicans in other regions, we need to monitor our colony very carefully.

There are dangers other than pesticides for such small breeding populations. The islands that they have chosen for nesting are eroding constantly, and the birds may soon be forced to move to another site. There is also danger from well meaning human visitors. While brown pelicans are most tolerant of brief human visits, long or too frequent disturbances on hot summer days can result in the death of eggs or young. This colony needs our help to assure that nesting sites will always be available and that nesting can take place without undue disturbance.

Brown pelicans have survived the storms of thousands of years of coastal living. Like "old salts" they relish the harsh environment of sun and salt air; however, the species does not appear to be holding its own in the face of new environmental hazards brought on by modern man. Through the concern and interest of individuals and groups of people and the environmental conscience of society, we must work to ensure the survival of this endangered species as an important component of coastal ecosystems.

TABLE 1. THE HISTORY OF THE BROWN PELICAN NESTING COLONY AT OCRACOKE INLET, NORTH CAROLINA.

Year	Date	Nests with eggs	Juveniles	Adults	Site	Reporter
1929	?	14 ?	?	?	Royal Shoal	W. L. Birsch
1947	6 Aug.	14	33	55	Shell Island	Bob Wolff
1948	19 July	0	0	225	Castle Rock	" "
1948	6 Aug.	0	0	200	Ocracoke Vicinity	A. D. Shaftesbury
1957	7 Aug.	35	87	162	Shell Island	Bob Wolff
1958	?	100+	?	500	" "	T. L. Quay
1959	?	?	116	?	" "	H. T. Davis
1960	29 June	6	85	?	" "	" " "
1961	8 July	2	51	?	? "	" " "
1965	4 July	?	77	70	Shell Island	John Grey
1970	7 July	?	31	68	North Rock	Roger Steiner
1972	23 June	30	17	130	" "	Parnell & Soots
1973	30 May	30	22	115	" "	" " "
1974	11 June	41	53	69	" "	" " "
1975	2 June	47	0	84	" "	" " "
1975	5 Aug.	0	39	175	" "	" " "

THE BOG TURTLE

A PROJECT UPDATE

PHOTO BY THE AUTHOR

by Ben A. Sanders
Wildlife Biologist
U. S. Forest Service

In an article appearing in "Wildlife in North Carolina" (February, 1974: pp 13-15), Ken Nemuras described some problems facing the bog turtle—*Clemmys muhlenbergii*—in our State which seem to be repeated throughout its range. The continuous loss of bog-type habitat through filling operations for one reason or another is reducing the amount of suitable habitat for this species alarmingly. If we look for reasons why this is happening, they are abundantly clear. Wet, boggy land has little value for the owners who pay the taxes on the land. To be useful, this habitat must be filled or drained and almost always we really don't know whether or not the turtle is present in many of these bogs. Highway construction may be an even greater threat because of the unfortunate distribution of bogs along valleys.

Nemuras' article stimulated much interest in herpetological circles across North Carolina. The Highlands Biological Station has since sponsored a bog turtle project to investigate the turtle's distribution in the mountains. During the summers of 1975 and 1976, field surveys have been conducted in many western North Carolina bogs by Robert Zappalorti, who is an expert with the Staten Island Zoo in New York. The U. S. Forest Service has provided field assistance on the Nantahala and Pisgah National Forests in this project.

Bill Palmer and Dave Lee, North Carolina State Museum of Natural History, have provided much useful data and support and the North Carolina Wildlife Resources Commission has agreed to restrict the issuance of collectors' permits to take bog turtles out of the wild.

Dr. Richard C. Bruce, Executive Director of the Highlands Biological Station, is providing supervision for the field operations in the mountains. After the turtles are captured, they are sexed, weighed, marked, and released back into the wild where they were captured. Subsequent recaptures of turtles can then be used as an estimator of total population.

Searching for bog turtles can be an exasperating experience for the unexperienced herpetologist. Until the habits of this furtive creature are learned, one can search unproductively in mud up to his knees for months. The author found his first bog turtle only after an expert taught him the ropes. A review of the literature gives the impression that bog turtles might be found rather easily as they bask in the sun, but whether due to difference in latitude or rankness of vegetation, this technique is of little value here. Many of our specimens have been found by hand probing in mud in depths of two feet. Others have been found partly exposed under tufts of sedges along rivulets in bogs. The two easiest captures were made by Clifford Bampton and Park Peterson of the North Carolina Wildlife Resources Commission. One turtle was crossing Highway #64 and the other was walking down a woods road.

Some significant discoveries have been made about bog turtles during the field work of 1975 and 1976. Apparently, all bogs that appear to be suitable do not have bog turtles even though they might be near to occupied bogs. And the turtles do not seem to be randomly distributed even in occupied bogs. This suggests strongly that there are rather specific environmental conditions necessary for bog turtle survival. At this stage, we can only make some educated guesses about these factors, but they may be related to temperature, cover, vegetation patterns, or juxtaposition of habitat elements within a bog.

The true status of the bog turtle in North Carolina will not be known until much more data is collected. In the mountains, we know of only nine bogs with turtle populations and these bogs are located on both National Forest land and private lands. The bogs on National Forest lands are secure, but at least some of the other bogs may be damaged by highway construction. This fact points out the pressing need for adequate biological assays of proposed highway routes, not only for bog turtles but also for other plants and animals with shaky status.

During the Symposium on Threatened Biota held in Raleigh in November 1975, the status of plants and animals in North Carolina was deliberated by the best experts available in the various fields. The committee on reptiles and amphibians classified the bog turtles as "threatened" in North Carolina based on the best evidence of its limited distribution and known threats to its habitat. This listing is consistent with action in New York, Pennsylvania, and Maryland which have had protective laws for several years. Unfortunately, the North Carolina listing does not include protective legislation which might be afforded by the passage of an endangered species bill for North Carolina, but it can serve as the basis for a petition to the Secretary of Interior to determine if the bog

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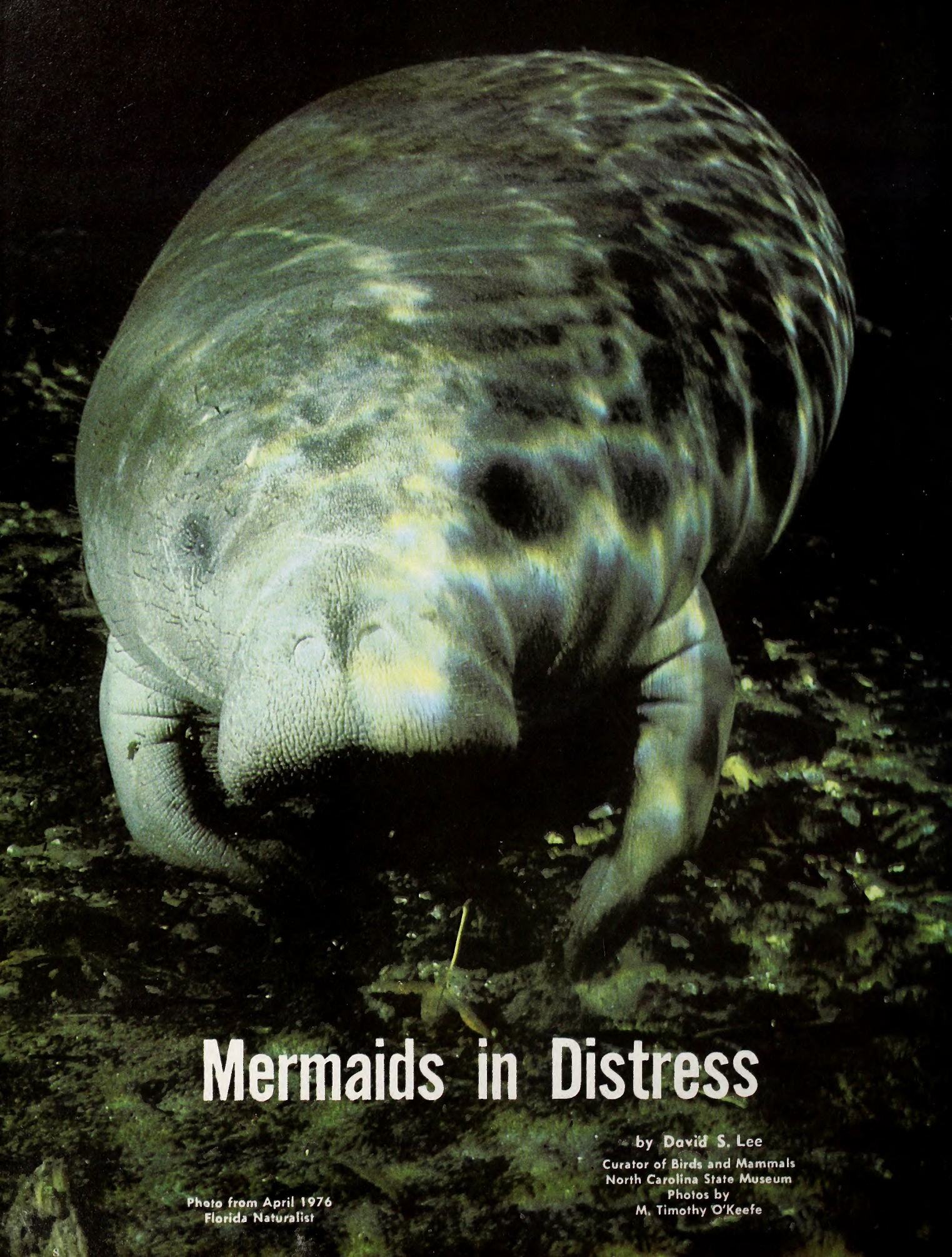


Mermaids in Distress

by David S. Lee
Curator of Birds and Mammals
North Carolina State Museum
Photos by
M. Timothy O'Keefe

Photo from April 1976
Florida Naturalist

THE legend of the mermaid probably had its origin in the tales of rum-soaked 16th century sailors returning from the New World, where they had seen manatees or sea cows. Although it seems hard to believe that such a phantasm should have found its way into the public imagination, if the story has any basis at all in fact, the manatee must get the credit—it is the only creature whose appearance comes even close.

The manatee belongs to a group of marine mammals known as the Sirenia, a name derived from the mythical sirens, temptresses who lured ships of love-struck sailors onto treacherous rocks with their sensuous singing. The Sirenia are our only herbivorous marine mammals, and only four species survive today. The Florida manatee occurs from the southeastern United States, the Caribbean, and along the coast of South America. Another species is found along the west coast of Africa, and the Amazon manatee is confined to fresh water in the upper reaches of the Amazon River. The dugong, a close relative, lives throughout much of the Indo-Pacific region. The Steller's sea cow, the largest of the Sirenia, became extinct around 1770, only 25 years after its discovery in the Bering Sea.

As a group these aquatic mammals were apparently more abundant during the Miocene and early Pliocene. Many zoologists believe that modern sea cows share a common ancestor with elephants. Their external appearance certainly gives no hint of such a relationship, but many anatomical similarities do exist.

Within historic times, large numbers of manatees roamed the inshore waters of the southeastern states, summering regularly as far north as southern North Carolina. In the winter, the northern populations would migrate south to Florida. Their numbers greatly declined because they were hunted for meat, oil, and leather. During the Great Depression unusually large numbers were killed.

Today the manatee continues to decline. This depletion has alarmed zoologists, and it is now officially protected by the 1972 Federal Marine Mammal Protection Act and by the Endangered Species Act of 1975. Stiff penalties are now in store for anyone caught deliberately harming a manatee.

Even with legal protection, the manatee populations are not likely to return to their former numbers, because their reproductive potential is very low. These animals are from six to eight years old before becoming sexually mature, and then only produce one calf every two or three years. Normally this low yield is offset by a relatively long life span, but now most individuals never reach old age.

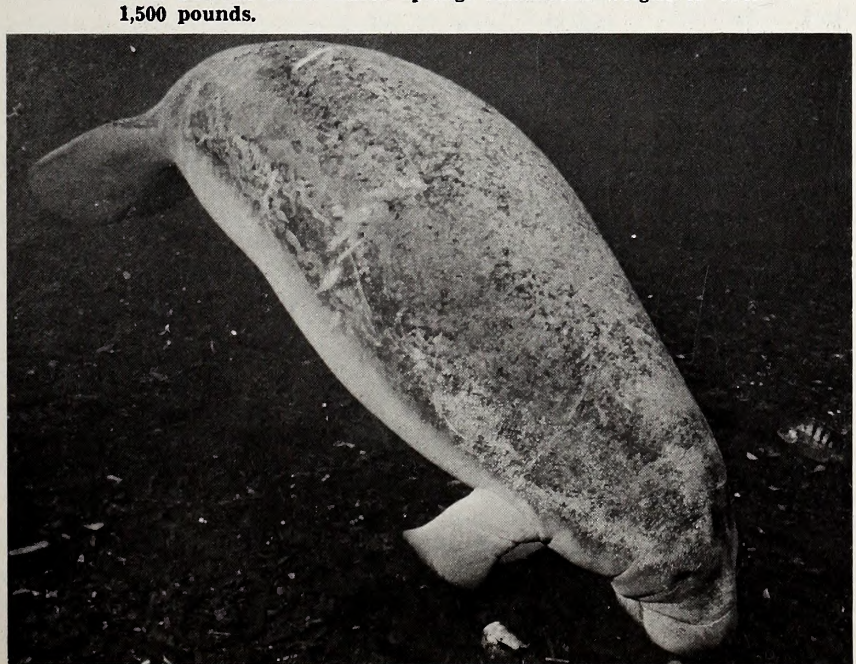
The most common calamity befalling these creatures is collision with speed boats. As human recreational activities in coastal areas increase, so does the number of speed boats and thus the number of encounters between man and manatee. The animals simply cannot move out of the way fast enough. Last year nearly half the known U.S. manatee fatalities were caused by boats.

The actual number of manatees left in the United States is unknown. In spite of their size, populations are difficult to census; they spend most of their time in the murky waters of estuaries, and only appear above the surface at all when coming up to breathe. Dr. Howard Campbell, Chief of the Manatee Research Program for the National Fish and Wildlife Laboratory, estimates there are at least a thousand of these animals in U.S. waters, but probably not many more.

If you have never seen a manatee, especially here in North Carolina, it is not surprising. Biologists recently thought that they had been extirpated from the northern reaches of their range. However, responses to questionnaires and posters distributed along the coast of the Carolinas in the spring and summer of 1975 indicate that the manatee still occurs here, although its numbers are probably very small. They have even been sighted as far north as Virginia. Although their current range is not precisely known, records of manatees north of Cape Lookout are few and far between. They are usually sighted near shore or in estuaries, but they do move up into the mouths of rivers for variable distances. Because of multiple reports from the lower Cape Fear River, it is suspected that this may be a center of activity for a small summering population.

• **continued on page 27**

This ponderous manatee daintily nibbles aquatic vegetation in a Florida fresh-water spring. Maximum weight is over 1,500 pounds.



The American Eagle – The Myth and the Majesty

Text and Painting
By Ches Crow

SILENCE, strength and honesty are the thoughts that enter my mind as I gaze at the ocean of blue above my head. The sky is clear with the exception of some soft whiffs of clouds hanging like smoke in the corners of my eyes. Suddenly again my visitor appears as if a door opened in the sun. A small shadow circling closer and closer. His eyes watching every crevice, every pebble for a movement. His tail feathers slant to the right and he slowly and majestically slices downward toward the earth.

Among the grass and underbrush, a small grayish-brown rabbit jumps and runs for cover only to be seized immediately by sharp talons. The attacker signals with a sharp cry that this is his catch and that all should keep away.

Our visitor is the golden eagle; the symbol of strength and might to every warrior back to Romulus and Remus. His likeness has been stylized on everything from coins to automobiles. The American Indians call him the war eagle, the ancient Romans made him the symbol of their empire.

All of this may sound poetic and flowery, but there are no words that can really describe the beauty and strength that this eagle typifies. Even though the bald eagle is more often thought of when people think of the eagle, the golden eagle has a fierceness that is not equalled by his white-crested peer. Don't think that this means the bald eagle is placid, for that is not true; it simply means that the latter does not show as much aggressiveness as the golden eagle.

• Let's look first at the bald eagle, for he is perhaps inching his way back and is more apt to be found here in North Carolina than the golden eagle. He was selected to be our national symbol in 1782, though he was not the choice of Benjamin Franklin. It seems that Dr. Franklin favored the wild turkey and of the eagle's habit of stealing from other birds Franklin said, ". . . like those among men who live by sharping and robbing . . . is generally poor and often very lousy." However, let's not quibble over the choice but be happy it turned out as it did.

An adult bald eagle is approximately 30 to 35 inches tall and weighs up to about 13 pounds. He is the largest flying bird known to man second only to the condor. The eagle's wing span stretches to seven feet from tip to tip. The bald eagle is not considered as graceful while flying as the golden eagle but this is a matter of opinion.

One of the reasons the bald eagle is considered to be more passive than his golden counterpart is his eating habits. The bald eagle subsists mainly on fish. His love of seafood, however, is hampered by his lack of ability

in swimming. If he does not become airborne quickly, he will become water logged and will drown. Because of this, he compensates by stealing his food from other birds such as the osprey, a distant cousin. The osprey is much more adept at the art of fishing and plunges into the water grabbing his prey and is back in the air immediately. Knowing this, the bald eagle will patiently wait and after seeing the osprey with his catch, will swoop down and steal the fish from the smaller bird.

Another technique used by the bald eagle is to circle and dive down again and again over a bird such as a coot or other waterfowl, making the bird so nervous that he dives underwater over and over until he is exhausted; then he becomes the eagle's dinner.

The bald eagle is not just content with fish for food even though it is a staple in his diet. Through the years he has been known to capture fox, deer and domestic stock when he is pressed for food. It is also known that carrion makes up a great deal of his diet. This may be contributing to the decline of eagles. Many of the animals he finds dead were killed by poison or insecticide, and these substances are thus passed along to the eagle.

Our friend is very intelligent when it comes to feeding. The famous ornithologist Audubon saw an eagle actually wading in the water catching fish with his beak. One of the most interesting and exciting abilities is the extraordinary feat of attacking geese in the air. The eagle will dive under the goose and imbed his talons into the goose's breast.

There are also the stories of eagles carrying off children though this is probably mere superstition; there is an authenticated story of an eagle trying and failing because of the clothing pulling away from the baby.

The bald eagle mates for life and has one nest or eyrie that is added to each year. These eyries over the years become immense in size and can be 10 to 20 feet across and weigh hundreds of pounds. Golden eagles usually build their nests on high cliffs in the mountains rather than in trees like the bald eagle. These nests are made of sticks and green leaves and usually two eyries are built instead of one. By having two, the eagles will use one nest one year and the other the next year adding more sticks and leaves to make it stronger.

The female eagle will lay two eggs each year and on some occasions, three. The eggs of the bald eagle are white where as the golden eagle's eggs are white or spotted with reddish-brown or gray.

The female will sit on the eggs most of the time, letting the male occasionally bring her food. After 30 to 35 days the eggs hatch and the fuzzy grayish-white eaglets emerge with their eyes open and as you would expect, with ravenous appetites. Both parents bring food to the young and guard the nest.

● This introduces an unusual theory that has been studied very closely in regard to the European eagle. The name that was given to this is "The Curse of Cain." From its name, you can imagine what this means: the older, stronger eaglet will get the food first and often antagonize the smaller, weaker bird until it eventually dies. Whether this is a wide-spread trait of the eagle I am not certain, but it has been seen and studied and appears in several species.

This theory was studied by two Europeans, Dr. Bernd-Ulrich Meyburg, and his colleague from Czechoslovakia Dr. Jan Svehlik. They simply took over one eaglet or even an egg from the nest and placed it in the nest of a tolerant and willing foster parent, a kite. They found that they could return the eaglet after about six weeks before they were about to fly.

After a few months, the eaglets begin to develop. However, it is some time before they are able to fend for themselves. They are not able to tear their own food for six to eight weeks, and do not leave the nest until 11 to 12 weeks of age. At this time, they still cannot fly well and must stay close to the nest. Their parents continue to feed them for several months because they are poor hunters.

Without going into detail, let's talk a little about the size and appearance of the eagles. The golden eagle is extremely strong and when the wind is just right he can carry an animal weighing as much as he does back to his nest. The beak of the eagle is very important because of the hook in the end. This enables him to tear his food after killing it. To give you an idea of its size, the golden eagle's beak is approximately two inches long and one inch deep. The bald eagle's beak is even larger. With a beak this large on a bird weighing 12 to 14 pounds, with a wing span of up to seven feet, you can see just how magnificent and deadly this predator can be.

One of the differences between the golden and bald eagle is the feet and legs. The feet of both are yellow, but the legs of the golden eagle are covered with feathers where the bald eagle's legs are bare. The obvious differences are the basic colors of the two as adults. The golden eagle is brown all over with a "golden brown" head. The bald eagle as an adult is obviously different with its white head and neck feathers imparting its name the "bald eagle." It is also a dark brown with lighter edged feathers. The tail of the adult is snowy white.

The life span of these beautiful birds depends a great deal on where they live. In captivity, eagles may live to a ripe old age of 50; but in the wild they perhaps average from 20 to 30 years. Wild birds are undoubtedly affected by our increased and often careless use of insecticides and waste materials. Recently, we have begun to realize the damage we have caused and may have reversed the mortality trend.

In the winter, groups of eagles will stay together but during the breeding season they will stake out different individual territories and keep all the other eagles away. The territories vary in size with the species. The golden eagle has the largest area which may extend 20 to 60 miles from his nest. The bald eagle's territory is much smaller and many times two or three may nest as close as a mile from each other.

● Our country's population of eagles has declined through the years for various reasons—mostly man-made. One of the last counts stated that there were approximately 15,000 eagles in the United States with most found in Alaska. This probably includes two other species of eagles, the white-tailed eagle and the Stellers Sea Eagle; they are related to the bald eagle but are found in only a few places such as Alaska and the Aleutian Islands where the Stellers Sea Eagle is found.

Only through diligent protection and care can we continue to enjoy the eagle in the future. When next the sun is gold and the sky is clear and the trees put on their coats of many colors, raise your eyes skyward and watch; you might just see our majestic friend as he wings his way over the land that is his. His future is in our hands. ⬍⬍

PHOTO BY LUTHER PARTIN

HOW IT WORKS

Mandatory Big Game Tagging

by Curtis Wooten

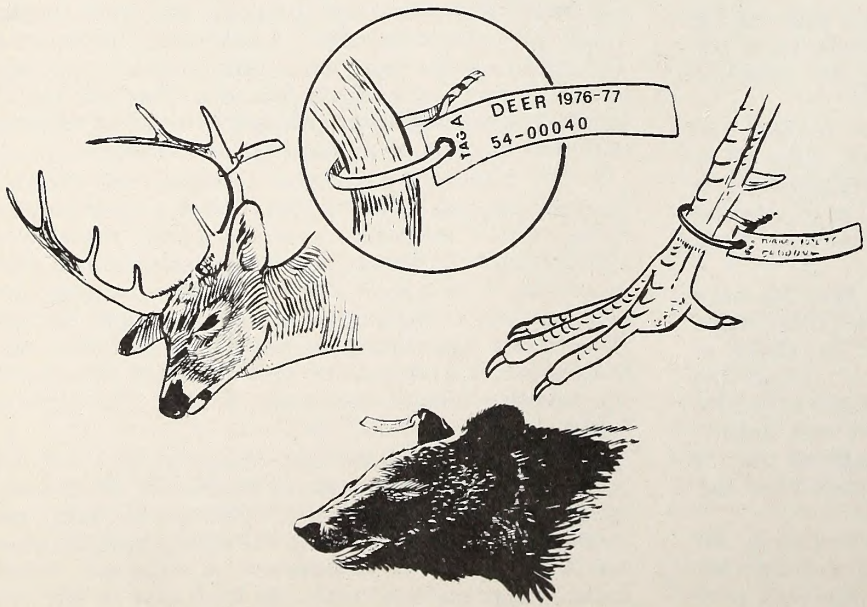
The mandatory big game tagging and reporting system will undergo its first large-scale operation with the opening of the fall 1976 hunting seasons. Under the provisions of the new law, which became effective on January 1, 1976, the carcass of each deer, bear, wild turkey and wild boar harvested must be tagged and a report of the harvest filed with the Wildlife Resources Commission.

The tagging and reporting procedure has been designed to be easily followed and to present as little inconvenience to the sportsman as possible. Yet, it will provide much needed information on the size and distribution of big game populations in each county throughout the state—information which will serve as a basis for better management and improved protection for our big game species. Here's how it works.

- When you get your 1976-77 big game license or sportsman's license, you will also receive tags for each big game animal you are allowed to harvest. The tags are perforated for easy removal and have a reinforced hole at one end. When you make a kill, remove the proper tag from your license and attach it to the animal—before the carcass is removed from the site of the kill.

  Wire fasteners, such as those used to close bread bags or plastic garbage bags, work well for attaching the tag, but any type of string, twine, wire or similar material can be used to secure the tag to the animal.
- After the animal is tagged, take it to one of the wildlife cooperator agents in the immediate vicinity of the area you were hunting. As in the past, cooperator agents are located at sporting goods stores, service stations, hunting license agents, hunting club headquarters and similar locations. They are readily identified by a large, yellow and black, diamond-shaped, Wildlife sign posted on the premises.
- The cooperator agent will furnish you a Big Game Kill Report Card. Remove the tag from the animal and attach it to the adhesive area on the Kill Report Card and fill in the requested information.
- The original of the Report Card remains with the wildlife cooperator agent, and the carbon is retained by you as your possession permit.
- Those who are by law exempt from the big game hunting license or sportsman's license are not required to tag their kill but they are required to report their kill just as all other hunters.

This sketch shows possible ways to tag antlered deer, turkey, and bear. Make sure that the tag is securely attached to the game at the kill site. The tag must remain on the animal until the Big Game Kill Report Card is completed at the cooperator agent station.



A cooperative effort by sportsmen, wildlife cooperator agents and Wildlife Commission personnel is essential to making the system work.

"We're confident," said Richard Hamilton, assistant executive director of the Wildlife Resources Commission, "that North Carolina sportsmen will work with us, as they have in the past, to provide this much needed information on the harvest of big game animals." ▲▼

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

Endangered Species Book

A new book, Endangered and Threatened Plants and Animals of North Carolina, will be available from the State Museum this summer. It is the proceedings of a symposium held in November, 1975, on the biology of our vanishing wild species, and it describes the status of each species of concern as well as habitats requiring protection. The book costs $8.00 and may be ordered from the N.C. State Museum of Natural History, P.O. Box 27647, Raleigh, NC, 27611.

Soon Be Time

If you buy a combination hunting and fishing license each year, don't forget that these expire July 31. Regular fishing licenses are valid through December 31. Fishing regulations are available where you purchase your license.

Ship Shape?

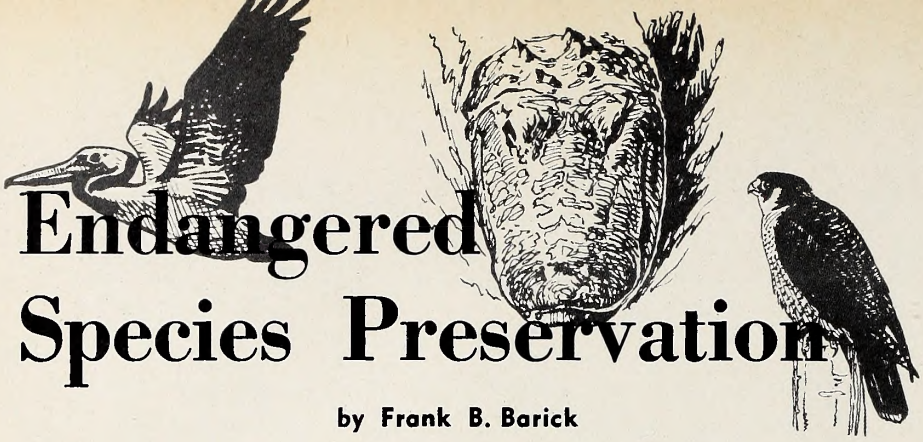
If yours isn't, watch for announcements of courtesy motorboat examinations by the U.S. Coast Guard Auxiliary in your area. They're free and will let you know of any safety deficiencies of your boat.

Avoid Danger Spots

Problems for you and your boat can crop up most any place, but you're asking for more trouble by operating your craft near dams (either above or below), in inlets, in unusually swift water and in shallow water. Avoid these situations, or if you must journey in or through them, take extra precautions.

Woodland Youngsters

The peak for nesting wildlife is past, but late broods of song and game birds, squirrels and fawns and other wild critters are still around. Leave them alone for their sake and yours.



Endangered Species Preservation

by Frank B. Barick

AT its meeting on March 29 the Wildlife Commission endorsed the establishment of an endangered species preservation program in North Carolina. The program is to follow the lines of the Federal Endangered Species Act which was passed in 1973 and is scheduled to provide funds to the states for this type of work starting this year.

The Federal Act is based on the finding that "various species of fish, wildlife and plants in the United States have been rendered extinct as a result of economic growth and development untempered by adequate concern and conservation. Other species have been so depleted as to be faced with extinction. These species are of aesthetic, ecological, educational, historical, recreational and scientific value to the Nation and its people."

The Federal Act declares that "the United States pledges itself to conserve, to the extent practicable, the various species of fish and wildlife and plants faced with extinction." The Act directs all federal agencies to orient their programs to fulfill the purposes of the Act. It further directs that the U. S. Fish and Wildlife Service conduct studies and restoration efforts and establish cooperative programs with the states, to be supported by grant-in-aid funds.

The grant-in-aid program is very similar to those being conducted under "Pittman-Robertson" for wildlife, and "Dingell-Johnson" for fish. A primary difference is that funding is at the 66 2/3 percent level rather than 75 percent. Also, funds for the endangered species program come from general tax revenues rather than from special taxes on hunting and fishing equipment. This is justified on the basis that preservation of various life forms is of interest to all of our nation's people, not just the hunters and fishermen.

The Wildlife Commission's program has always included concern for wildlife beyond those species that provide sport for hunters and fishermen. This new federally funded program, however, will provide a means of adding emphasis and depth that has been beyond our capacity in the past.

The greatest need at this time is to develop more precise information on the status and distribution of endangered species in North Carolina. For example, we need to find out how many red-cockaded woodpecker colonies exist in the state, where they are located, what circumstances are adversely affecting their survivability and what can be done to ensure their survival as a species. We need similar information about the Indiana and gray bat, the Delmarva fox squirrel, the bald eagle, the brown pelican, the cougar or panther, peregrine falcon, and the alligator. These are the species on the official endangered species list of the U. S. Fish and Wildlife Service that occur in North Carolina, and as such they constitute North Carolina's official list.

In addition to those on the federal list, there may be other species that need attention in North Carolina. A few years ago several teams of biologists from educational and other institutions across the state pooled their knowledge about various species that appear to be severely reduced in numbers or distribution. These findings and opinions are summarized in a publication entitled "Preliminary List of Endangered Plant and Animal Species in North Carolina." It contains many more North Carolina species than those on the federal endangered species list We need to conduct careful studies of each of the species on this Preliminary List as well as those on the federal list. The new program will provide funds to employ specialists on a temporary basis to conduct in-depth studies of these species.

As a result of the studies, recommendations will be developed for actions necessary to ensure the preservation of each species. This could entail the acquisition of critical habitat for nesting and rearing of young, or the development of land use practices to ensure the maintenance of proper habitat, or the enactment of certain regulations governing the taking or commercialization of particular species. It is likely that in most cases merely advising a landowner that he is host to an endangered species will evoke special consideration on his part.

Recommendations in regard to management or regulation will probably be developed with the assistance of a special Advisory Committee consisting of professional biologists, bird-watching organizations, industrial interests, landowner interests and other lay public. This will ensure that recommendations for action will be broadly based rather than reflecting the views of a narrow segment of our population. Recommendations for regulations or other action programs developed by this group will be submitted for consideration and approval by the Wildlife Resources Commission.

Providing the State's share of funds to match the federal money poses somewhat of a problem. While most sportsmen are as much interested in the preservation of endangered species as the most ardent bird watcher, it really would not be fair to fund the State's share entirely from hunting and fishing license revenue. Also, we already have evidence that there are those who would welcome an opportunity to support the Wildlife Commission's efforts in conservation of non-game and endangered species. It is for this reason that the Commission is providing for the sale of decals and prints featuring non-game and endangered species as described elsewhere in this issue.

Many of those who subscribe to "Wildlife in North Carolina" are hunters and fishermen, and many are not. But obviously they all share a common interest in the preservation of wildlife and we trust they will endorse and support this new dimension of the Commission's wildlife conservation program. ◆

Be a Carolina Conservationist

Here's how you can help our non-game and endangered wildlife species even if you don't hunt or fish.

WHILE reading a recent environmental impact statement concerning a large development which would destroy several thousand acres of valuable wildlife habitat, we were pleased to note that those agencies opposed to the planned project included the Wildlife Society, the Audubon Society, the Friends of Animals and the Humane Society. The list of opposition was large but the important point was that all of these groups, including many with widely diverse self interests, had united to oppose the conversion of our woodlands into parking lots. This is the kind of concerted effort that will be required to make our total wildlife program in North Carolina a success.

Since 1947, the Wildlife Resources Commission has been responsible for the management and protection of all wildlife in North Carolina. This means simply that all of the regulation, enforcement, education, management and research efforts made toward both game and non-game species alike have been financed by the hunters and fishermen of North Carolina. While these sportsmen haven't complained about paying more than their share of the total wildlife bill, the time has come for all individuals with an interest in our wildlife resources to help with the finances.

Several of our native species are being threatened by the continuing destruction of available nesting cover, and many of our non-game species will require indepth studies if we are to be able to manage them wisely. These programs to conserve our non-game and endangered wildlife species will require the financial support of all North Carolinians, not just those who support our wildlife programs through the purchase of hunting and fishing licenses. This is where you can help.

The 1975 North Carolina Legislature authorized the Wildlife Resources Commission to establish a contributions program to help finance the work presently being done on non-game and endangered species. This *Carolina Conservationist* program will allow those wildlife enthusiasts who neither hunt nor fish to contribute funds to be used especially for the protection and proper management of non-game and endangered species.

Those *Carolina Conservationists* who donate a minimum of $5.00 will receive a colorful decal. Those contributors giving $25.00 or more will receive both the decal and a full color limited edition wildlife print. The 16" x 20" lithograph will feature the red-cockaded woodpecker which has been chosen as our endangered species for 1976. This will be reproduced from the painting featured on the cover of this month's WILDLIFE IN NORTH CAROLINA. The lithograph will be numbered and signed by the artist. A new "featured" species will be chosen annually for illustration on the print and decal.

Persons interested in participating in our *Carolina Conservationist* program should mail their contributions to *Carolina Conservationist,* c/o North Carolina Wildlife Resources Commission, Division of Education, 325 N. Salisbury Street, Raleigh, North Carolina 27611. Checks should be made payable to the North Carolina Wildlife Resources Commission and designated as a Carolina Conservationist contribution. ◆

Saving The Red-cockaded Woodpecker

The Sandhills Game Land Approach

by George E. Smith
Division of Game

CURTIS fitted the telephoto lens to his camera and pointed it towards a small cavity about 40 feet up the trunk of a nearby longleaf pine. He then settled down and waited motionless, for the red-cockaded woodpecker which had hastily departed a few moments earlier. We soon heard a chattering sound as the bird announced its presence.

I watched, about 50 yards away, as the small, black and white woodpecker made short flights from tree to tree. It circled the "home" tree a few times and then finally settled into position in the tip of a broken-topped pine directly behind the photographer. From where I stood, it made quite a picture as Curtis watched for the bird, unaware that the bird was watching him. He was hoping for a quick snapshot, but the woodpecker was only interested in a gracious departure by this intruder.

It was a standoff for awhile until Curtis finally retreated from his position and walked over to where I was standing. "My camera got a little heavy," he offered, obviously a little disappointed. "Yeah," I said, "Look behind you; our bird just returned home." We watched as the red-cockaded moved up and down the old longleaf pine, making a thorough inspection to be sure all was well.

This little episode took place on one of my recent trips to the Sandhills Game Land. Curtis Wooten and Luther Partin, with the Commission's Division of Education, went along to photograph some of the endangered species management activities presently being carried out on this area.

Most readers of WILDLIFE IN NORTH CAROLINA are well aware of the present endangered status of this species of woodpecker (see "Saving the Red-cockaded Woodpecker" November 1975). Cooperative efforts are now in progress throughout the southeastern United States in an effort to improve the lot of this small, non-game bird. The North Carolina Wildlife Resources Commission has taken an active role in this endeavor. One important step has been to implement a program for habitat protection and improvement on Game Land areas where the woodpecker now exists. The Sandhills Game Land is where most of this work is being accomplished and provides a good example of how proper habitat management can improve the prospect of having the red-cockaded woodpecker with us for a long time to come.

A general familiarity with some of the bird's unique biological requirements is essential in understanding some of the management practices which will be described later. Let's look at a few of the more important aspects of the biology of this species.

The mature pine forest of the southeastern United States is home for the red-cockaded woodpecker (*Dendrocopos borealis*). It now exists in reduced numbers due to lumbering and general urbanization in most of the southeast. In North Carolina, the Sandhills region offers the best remaining habitat due to fairly extensive stands of preferred, old-growth longleaf pine. Cavities are usually constructed in trees at least 60 years of age and are more

The nest trees of the red-cockaded woodpecker are generally easy to spot with their extensive areas of white or sulphur colored resin drippings. Patience may be required to see the adult birds, however.

likely to occur in older trees (Hopkins and Lynn, 1971).

Life centers around the cavity tree—trees in which cavities are excavated and utilized for roosting and nesting during the life of a colony (1). Nesting occurs each year in April through June. One unique feature is the bird's preoccupation with "resin chipping" around the cavity opening. This practice results in a sticky, thick resinous material which is exuded by the surface layers of tree tissue. It is thought that chipping is primarily done to deter predators such as snakes and flying squirrels from entering the cavity (Dennis, 1971).

It might take anywhere from a few months to several years to construct a cavity that can be used (Carter, 1974). If these trees are indiscriminately harvested in logging operations or lost to natural causes over a short period of time, woodpeckers occupying the site will most likely perish. Therefore, land management practices must insure the protection of cavity trees and provide for a continuing supply of "potential" replacement trees within the range of each colony. By way of explanation, the colony is not a group of birds, but rather, is an area of roost, nest and start cavities used by an associated group of birds called a clan. The clan functions together in the rearing of young and is made up of a mated pair, offspring and various helpers (1).

Food is another factor which must be considered. The red-cockaded woodpecker feeds on a variety of insects, but spiders, centipedes and various types of mast are also utilized (Baker, 1971). Adequate feeding areas must be available and be in close proximity to each colony site. These areas are generally made up of stands of pine trees—the older, the better—adjacent to the colony. While colony sites range in size of from one-half to five acres (with two to five or more cavity trees), the feeding area is much larger. The required area varies according to the colony size, the age of the forest and even the site productivity (Thompson and Baker, 1971). These areas are usually managed as support stands with the idea of providing areas for colony expansion. On the Sandhills Game Land, a minimum of 40 acres of support area is assigned each colony.

With these basic facts in mind, we are now ready to explore means for helping the bird through habitat improvement. On the Sandhills, special management practices have been applied in an orderly, step by step approach. The first logical step is simply locating the colony sites. Wildlife management technicians have been surveying each timber unit in an effort to locate cavity trees which determine these key sites. It is essential to identify these locations prior to planning activities such as logging and prescribed burning. After these trees are located and recorded on maps for future reference, they are marked with a band of white paint to prevent accidental cutting or damage. Approximately 80 colonies have been located and recorded thus far, and a total of 357 cavity trees have been marked.

Each cavity tree is further "enhanced" for long term use by red-cockaded woodpeckers through the removal of all understory vegetation within a 20-foot radius of the tree. The purpose of this somewhat odd procedure is to create a condition which the bird prefers—an open understory with no obstruction near the cavity. Brush competition eventually results in abandonment of the tree or the construction of a new cavity above the brush line. The Sandhills prescribed burning program is being used as an aid to reduce this unwanted competition within the colony site. Burning is accomplished on a rotation basis throughout the pine forest land and is carried out during the winter months. Damage to standing timber is minimal during this season. Leaf litter and other combustible materials are removed from around each cavity tree to prevent the thick resinous layer from igniting and possibly causing heat damage to the tree. Since the red-cockaded woodpecker is a fire adapted species, burning, when properly applied, poses no problem to the birds in the colony site.

Modifications in the Sandhills Game Land timber cutting program have been initiated to protect these key areas already mentioned. For example, marking guidelines provide that no cavity tree is to be marked for sale. Sufficient potential trees within the colony site and in surrounding support stands are left for as long as the colony area exists. Timber sale agreements include a provision preventing any activity relating to the logging job from being carried on within colony areas during the nesting season. Little harvesting will be done within colony sites or support areas

One of the first steps in protecting and managing this woodpecker is a careful inventory of the nest trees and colonies. Locating and documenting these colonies is a slow process.

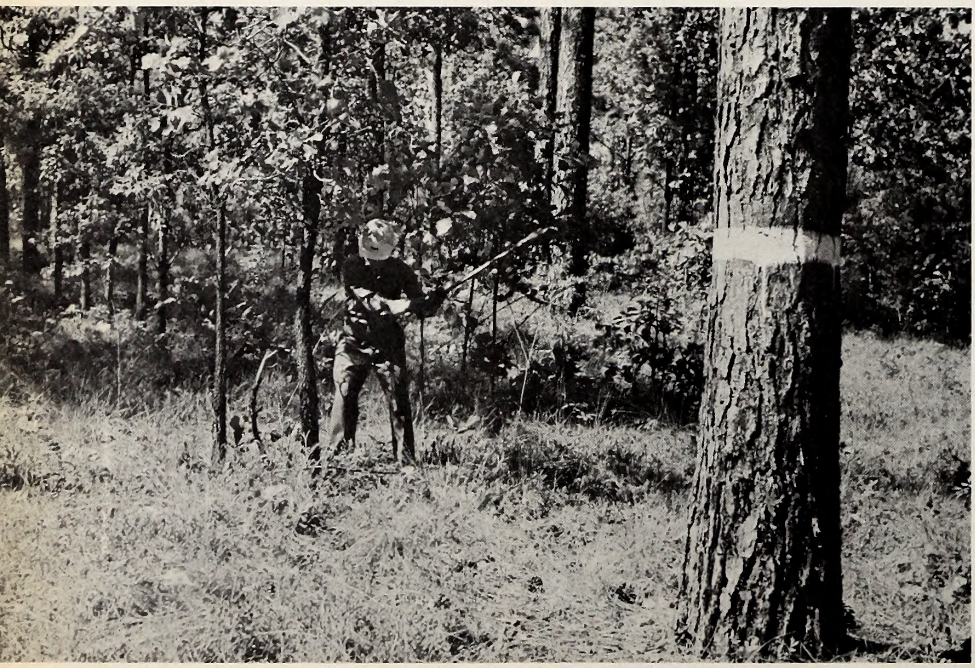
with the exception of an occasional thinning if needed to keep the stand in an open condition.

Finally, a comprehensive Sandhills forest management plan is now in the final stages of completion which will give the red-cockaded a better chance for survival in the future. The overall purpose is to plan now for replacement stands which will be available to the woodpeckers as present stands of trees are eventually lost through natural causes—fire, disease, etc. These stands will be managed as even-aged sites and will be large enough to support populations of this bird.

One question remains—will the game and forestry benefits, which have been a valuable part of the Sandhills Game Land for a long time under Commission management, be diminished as the bird's future is insured? We feel that all of the major objectives, from the production of game for the enjoyment of the hunter to the growing of timber for marketing, can be accomplished without major conflict in the endeavor to save this endangered species. At the present time approximately eight percent of the total Game Land area, including support stands, is being utilized by this bird. Practically no game management compromises have been made on these sites. In fact, most practices which benefit the red-cockaded also benefit the game species managed here. Some timber production will obviously be lost as stands are carried past maturity. However, the "lost" volume will be relatively small compared with the total production of the forest on this area. At any rate, this time and effort will be well worth the cost if just one of the many species of wildlife, now on the endangered list, is saved from the brink.

Oh yes, Curtis finally got all the snapshots he wanted, but we had to find a more cooperative clan of red-cockaded woodpeckers.

Each nest tree in the colony is marked with a band of white paint to prevent accidental cutting or damage. Removal of all understory vegetation around the tree (below) seems to "enhance" the tree for long-term use by the birds. Prescribed burning is also used.



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How to Get Loaded by Yourself

FISHING

by Jim Dean

● Putting a 10- to 14-foot boat on top of a car is easy if you've got someone to help. But when you're alone, it can be a problem because it's a rare man who can lift a 12-foot, 115 pound boat over his head and set it down level on the roof racks without busting a gut or scratching some paint.

You can do it with a canoe, but a plywood or aluminum cartopper is another matter.

The problem is magnified if your car is a sedan. With a station wagon or van, you simply attach one of the roof racks near enough to the back so that you can lean one end of the boat on the rods then slide it forward. With a pickup truck, one man can easily slide a boat into the back. But with a sedan, you can't reach over the trunk or the hood, so the only approach is from the side. Unfortunately, the roof racks are angled the wrong way.

The solution is simple, and it's probably been around since Ford had his original better idea. All you need to do is mount two parallel side rails on the roof rack so that the rails and the rack form a tic-tac-toe pattern. Now you can lean the bow of the boat against one of the side rails, then lift the rear of the boat, and swing it around onto the racks (see photos).

Using this simple technique, one man can load any boat that is capable of being car-topped. I've even loaded a Sears Gamefisher, and those things are heavy. A 12-foot aluminum johnboat is a breeze.

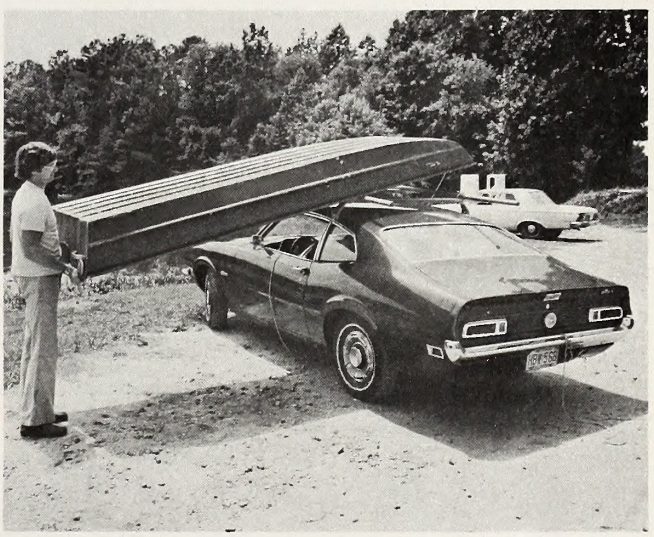
There are a few tips worth passing along. Be sure the rails are strong. I bought two, five-foot chair rails at a lumber yard, and I checked to make sure the grain was straight and ran the full length of the rail. Two-by-two boards will also work. If the grain runs out somewhere along the length, that's where the rail will split. Needless to say, you don't want a rail to break while you're loading the boat.

You could bolt or wire the rails to the roof rack for a permanent setup; however, this could be troublesome if you ever want to take the racks off the car. I've found it adequate to simply tie the rails onto the rack to keep them from sliding.

One friend of mine decided that he could improve on the "rail idea," so he got a big sheet of three-quarter inch plywood and drilled holes along the side so that he could lash it to the roof rack. "That way," he explained, "I can also carry suitcases and camping gear on top as well as a boat."

Actually, it wasn't nearly as good an idea as it sounded. For one thing, the plywood sheet he used was so large that it was almost like a wing. He swore he could get airborne at 40 miles per hour. Also, it made a thunderous noise. Undoubtedly, a smaller piece of plywood would have worked, but my friend swapped the sheet for a set of rails.

One man can prop the bow of the boat against the side rails, then pick up the rear of the boat and swing it around so that the boat rests solidly on the roof racks. It's a simple solution to an old problem. Just make sure the rails you buy are strong enough to support the weight of the boat while you're loading and unloading.



The idea of using rails is an old one, and there have even been one-man, commercial loaders on the market in years past which accomplished about the same thing. In fact, it would never have occurred to me to mention it here except that quite a few pond fishermen have seen my "chair rails" and remarked that it was an idea they planned to try. I can't take credit for it, but I can assure you that it works—and it's cheap.

TURTLES OF THE SEA

by Tom Griggs
Jacksonville
Photos by the Author
Painting by Ches Crow

THE wild sea oats grew tall atop the rows of sand dunes and bent gently in the summer coastal breeze. I sat on a large dune where I could gaze far up and down Camp Lejeune's Onslow Beach. My mind conjured pictures of infantry Marines charging across the beach and over the dunes during practice amphibious assaults.

Marines have trained on Onslow Beach since the construction of Camp Lejeune in 1941. For more than three decades, Leathernecks have swarmed ashore from a variety of landing craft which have changed over the years with other advancements in military equipment.

But I was waiting to watch the landing of unchanging creatures that have visited that North Carolina beach for hundreds of years—years before a U.S. Marine Corps was ever conceived—the Atlantic loggerhead sea turtles. These great marine reptiles lumber ashore during summer nights to bury their eggs in the warm beach sand.

I was so entranced with the rhythmic washing of the surf upon the beach that I barely heard the military jeep plowing through the sand behind. The driver appeared impatient as I stood up atop the sand dune.

He was Julian Wooten, the base ecologist at Lejeune. While mostly involved with work like oil pollution abatement and the protection of soil, water and air resources, Julian was presently studying the sea turtles. He says it is a cooperative effort between himself and Charles Peterson, the base wildlife manager.

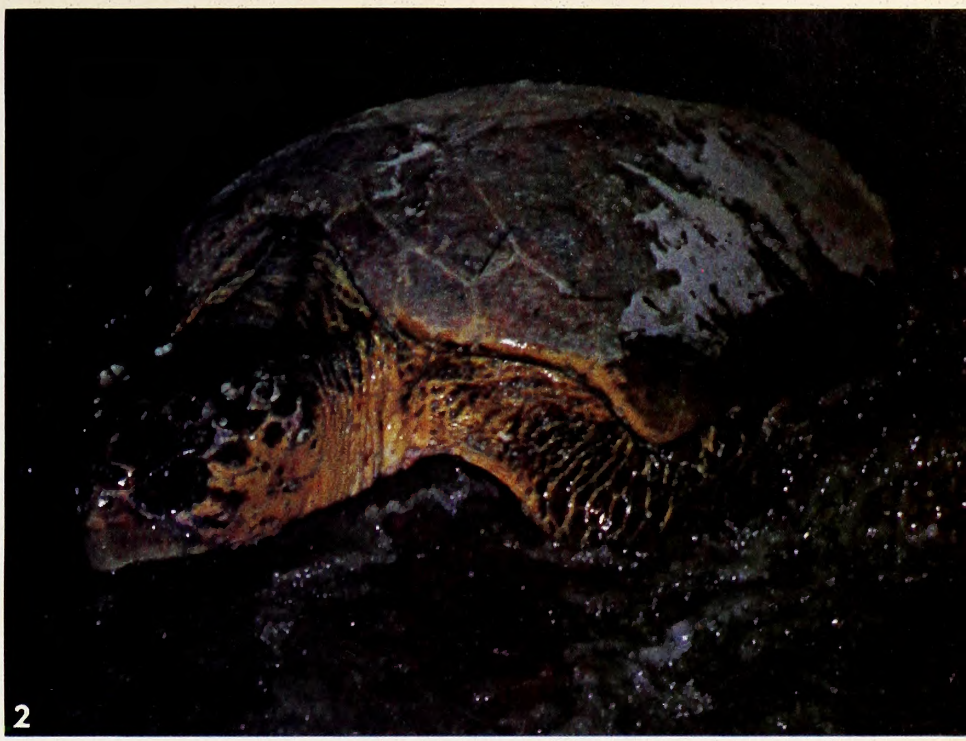
We drove down a sandy road between the beach and the Intracoastal Waterway until we found an opening in the dunes. Julian explained that a turtle was already ashore, about five minutes away. He had driven along the hard-packed sand before our scheduled rendezvous and sighted the female reptile on a more isolated part of the beach.

The young ecologist, a Pembroke State biology graduate, says the loggerheads have a problem. They face a severe population decline and are on the North Carolina Endangered Species List. And they are not alone.

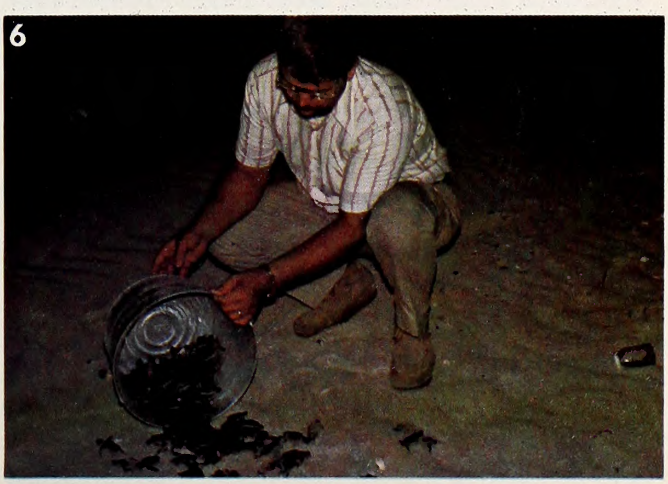
According to Julian, four other species of sea turtles are included on the state's roster, and three of those are on the Department of the Interior list. Some authorities see the situation as even more grave . . . all sea turtles have been classified as endangered or threatened in the judgement of the International Union for the Conservation of Nature and Natural Resources.

Those sea turtles include the hawksbill, ridley, leatherback, green and Atlantic loggerhead, plus several subspecies. But why have their numbers dwindled? A definite cause has been man's literal slaughtering of the creatures in many parts of the world. Man as a predator has hunted, let's even say harvested, these great marine reptiles for food and material products. Ever taste turtle soup? Worn turtle shell jewelry? If so, you have experienced just some of the end products which have brought about the present plight of sea turtles.

The Atlantic loggerhead is fortunate in that its shell is worthless, and its meat is not edible, or at least not favored. Only its eggs have been hunted by man. Yet that, coupled with construction along so many coastal areas, has dwindled the ranks of the loggerhead. Highways and new housing along southern U.S. coasts have hampered the loggerheads' breeding



1. An Atlantic loggerhead sea turtle deposites her eggs (114 of them!) in a newly dug nest on Camp Lejeune's Onslow Beach. 2. Egg-laying complete, she enters the surf and returns to the sea. 3. Camp Lejeune ecologist Julian Wooten (left) and deputy game warden Mike McGill count the eggs in a loggerhead nest. 4. An adult turtle is tagged before release. 5. Newly hatched turtles are assisted from a protected nest (note "cage"). 6. And then released into the surf.



grounds. Even where these turtles have found unspoiled beaches for reproduction, wild predators raid their nests.

Julian has an advantage where he works to help the Atlantic loggerhead. The North Carolina Marine Corps base is relatively isolated to outsiders. There are no illuminated paved roads along the beach, no cropping up of beach homes and no vacation resorts. In essence, Onslow Beach is an undisturbed and undeveloped 14 miles of natural beach. It is a beach where the sand dunes still stand untouched, three rows back-to-back, straddled by the Intracoastal Waterway.

Darkness had settled in when we reached my first loggerhead. It was the full moon in June, and under the moonlight we watched this fascinating reptile of the sea construct her nest. Its back flippers would alternately scoop out sand, flinging it to each side. Occasionally she would snort like an old work horse. Gradually, as the minute hand of a clock slowly but surely turns, the 300-pound turtle created a hole about 10 inches in diameter and almost perfectly round. The whole process lasted about 45 minutes.

When the hole was deep enough—about a foot and a half—the eggs began to drop. They were round and white and covered with a wet, glistening film. After some time, I wondered how the hole could hold them all. There were more than a hundred. But it did, and then the shelled reptile began the laborous task of covering her future young.

Finally, following some 10 minutes of work, the loggerhead was satisfied with the cover and makeshift camouflage. She turned toward the surf and pulled herself forward. That is when Julian motioned to me for assistance. As the loggerhead worked its way off the face of the sand dune and onto the firm beach sand, we turned it over on its back. For Julian and me, his unofficial assistant, it was time for work.

We measured the length of its flippers, width of the head, length and width of the shell and approximated its weight. Julian next traded the measuring tape for an electric drill, which he used to make a tiny hole in the rear of the shell. There he wired on a small red tag. The tag was inscribed with an address and reference number. And then, with a heave and a pull, we rolled the turtle upright, and she continued her return to the sea. Into the surf, the creature soon disappeared under churning water.

The address on the special red tag was that of the University of North Carolina's Institute of Marine Science at Morehead City. There Dr. Frank Schwartz carries on research in marine science, and Julian has undertaken the study of loggerheads in conjunction with Frank's work. Julian sends all his collected data to the facility at Morehead.

Tagging is important. Little is known about the mysterious migrations of the sea turtles. Knowledge is also limited as to their growth and death rates. Hopefully, tagging will reveal their routed treks to warmer waters, potential growth and their curious, and not so curious, shortcomings.

One known fact is that a sea turtle returns to its place of birth to reproduce and lay eggs. A female loggerhead hatched on Onslow Beach will always revisit that very beach when nature beckons it to reproduce. It is another unexplainable example of animal instinct. Julian also knows that some part of the loggerhead's instinct calls it ashore most often during a full moon. Most of Julian's nighttime research has taken place during the full moons of June and July when the turtles come ashore in the greatest numbers. A few trickle in during the four nights of August's full moon. The green sea turtle also ventures near the Lejeune shores, but none beach themselves to lay eggs there.

The Camp Lejeune ecologist is able to make a close estimate of how many loggerheads do come ashore there. He simply counts the turtle tracks on the beach each morning during the laying season. Over the entire three month period during the past summer, at least 77 turtles crawled into Onslow Beach, according to daily checks of turtle tracks. Only 40 nests were found, proving that not all turtles succeed in laying eggs.

On the four full moon days during each month of June, July and August, Julian employed the help of a Marine helicopter from the neighboring New River Marine Corps Air Station. Together they flew missions up and down local beaches in search of turtle tracks. Besides the tracks sighted on Onslow Beach, 23 trails were left in the sand on Brown's Island, a Camp Lejeune impact area. And on flights as far north as Morehead City and south beyond Wilmington, more than 50 turtle trails were spotted.

Preservation of the turtle nest plays a vital role in Julian's work. Nests must be protected from foxes, raccoons, opossums and even wild house cats. He pointed out that during the previous year, approximately 90 percent of all loggerhead nests on Onslow Beach were destroyed by these predators. However, the problem was practically eliminated during this past season when the ecologist placed protective wire cages over every nest. The results? Only two nests were ransacked by racoons.

The clutches have been protected. Yet, many still fail to survive. Some eggs don't hatch. Those turtles that do hatch out, face hazards between the nest and the water. They are picked off by ghost crabs, sea gulls and even racoons and foxes if they are on the spot. And in the water, the young are pitted against fish like sharks and blues.

Julian believes the survival rate is not more than 10 percent. He says that maybe even as few as one or two percent survive in many cases.

While survival after birth for the sea turtles is held in a rather pessimistic light by most authorities, the percentage which initially hatch from the nest is fairly respectable, considering no parent is around to assist. And the percentage of young that hatched at Camp Lejeune this past summer and very early fall was above expectations. Julian counted the number of eggs in each of the 40 nests found on the beach. Each averaged 100 eggs, so certainly 4,000 eggs were buried in the Onslow sand. The ecologist was on hand to see more than 2,000 young turtles hatch on the beach. Seventeen nests were not counted. In addition, many eggs were incubated in Julian's office because some nests were dug too close to the dangerously pounding surf. The total reproduction rate was admirable. An average of 83 percent of all eggs hatched. That is significantly above average.

This summer, the Atlantic loggerheads will again surface off the beach at Camp Lejeune and crawl ashore under the light of the full moons. And again, ecologist Julian Wooten will be waiting to watch and learn and carry on the work of solving the mysteries which surround one of our most fascinating wildlife. In the meantime, the Atlantic loggerhead sea turtle is unfortunately an endangered species. ▲▼

Storm to Storm

BY ED JENKINS

Nothing, save his boat and motor, is more important to the pleasure boater than the weather. Be it big, or small, power or sail, a boat is at the mercy of Mother Nature. It's a wise skipper that heeds weather signs.

Newspapers, radio and television broadcasts, and the weather advisory flags at many harbors, offer reliable weather information to the boater and keep him informed of the latest developments. Nature also has weather forecasting information, and if one pays attention to what he observes around him, he can use this information to help predict the weather.

Just as a sudden fall of the indicator of a barometer predicts unsettled weather ahead and dictates extra caution, movements of insects and birds, plants, smoke and smells signal changing weather conditions. By observing the natural conditions occurring around us, we can use nature's barometer to help forecast the weather. Observations that can be helpful in predicting the weather are listed below.

Birds roost more before a storm because low pressure air is thinner, making it harder to fly. Low air pressure usually accompanies rain and bad weather. Swallows and bats will fly closer to the ground when air pressure is low to increase the pressure against their sensitive ears.

As bad weather approaches, hawks and birds of prey appear to be more active in search of mice, snakes and small animals exposing themselves as they look for higher ground.

Insects become more active before a rain. Spiders build more webs to catch active insects. Ants start building mounds of dirt around their holes. Flies attracted to the dampness of a person's skin and the increased body odors released when air pressure lowers become more of a pest when rain is on the way.

The odor of ditches, basements, swamps and low areas is stronger before a rain. The captive odors that were held in by high air pressure are released as pressure lowers and things subsequently have a stronger smell.

Smoke rising straight up from a chimney indicates fair weather; smoke that does not rise quickly and trails out of the stack indicates poor weather.

White cumulus clouds are a sign of fair weather because they reflect the sun's rays. Cumulus clouds that are grey reflect the darkness of earth and are full of precipitation.

A ring around the moon indicates changing weather. The ring is caused by the light of the moon coming through high ice crystals in the atmosphere. Usually the halo indicates a long slow rain will follow.

Before the days of modern weather forecasting and communications, our forefathers relied on weather proverbs, among other things, to help them predict the weather. While these adages were not always reliable, they were based on general weather occurrences that had been observed and often times held true.

Some of these weather sayings along with possible explanations for their validity are given below.

When the dew is on the grass,
Rain will never come to pass.
When grass is dry at morning light,
Look for rain before the night.

Dew on the grass at night or in early morning is a sign of fair weather. It only forms when air is dry and skies are clear.

Lightning in the south, brings little else but drought.

In this hemisphere weather moves from west to east. Weather in the south or east will pass below us and should not bring any rain into our area. If lightning is west or northwest, a storm will usually reach you.

When the night has a fever, it cries in the morning.

If the temperature increases between sunset and midnight, it will usually rain.

Red sky in morning, sailors take warning.
Red sky at night, sailors delight.

Weather patterns move from west to east, and weather conditions that exist west of us will generally move in our direction. As the sun sets in the west its rays pass through the atmosphere that will be present in our location the next day. The sun's rays passing through clouds and humid air will make the sky appear grey or yellowish at sunset. The sky will appear red at sunset if no clouds are blocking the rays.

Other adages that have been used and passed on through generations are:

The higher the clouds, the better the weather.

Rain long foretold, long last;
Short notice, soon past.

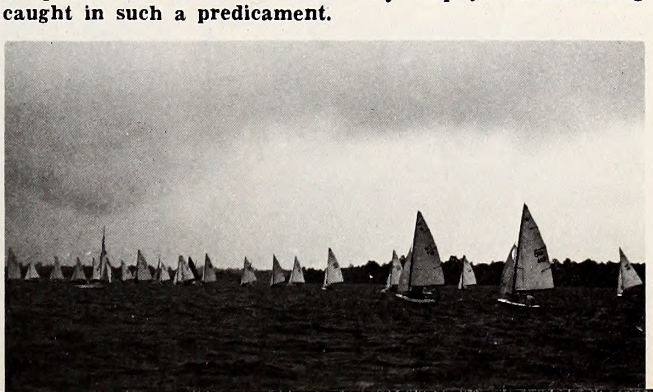
A sunshining shower won't last out the hour.

Morning rain is like the old lady's dance!
It doesn't last very long.

Even though all the weather signs appear favorable, keep a close eye on the weather while on the water. Thunderstorms usually occur in the early evening and late afternoon over inland and coastal waters and give little advance warning of their arrivals. Don't ignore the obvious signs of a storm. Build-ups of massive cumulo-nimbus clouds indicate heavy weather. Beware of sudden calms, too. They often signal that a major weather change is coming—quickly.

Learning to read weather signs is a must for boaters. Mother Nature does not look kindly on those who don't heed her warnings.

This is not the place to be nor the boat to be in during a squall. This month's column may help you avoid being caught in such a predicament.



1974-75 HUNT REPORT

by T. Randy Porterfield
Wildlife Biologist
Division of Game

A group of North Carolina sportsmen helped the North Carolina Wildlife Resources Commission gather information about the 1974-75 hunting season. The names and addresses of 6,692 sportsmen were selected from the file of 434,519 persons who purchased licenses to hunt during the 1974-75 season. Questionnaires were mailed to the hunters for this mail survey after the season closed. A total of 3,493 sportsmen returned the completed questionnaires.

Questionnaires were edited by personnel of the Commission's Division of Game and the information was transferred to computer cards by personnel of the Data Processing Section. The survey was computed and tabulated by the Southeastern Cooperative Game and Fish Statistics Project which is headquartered at N. C. State University. Information from the survey has already been used by the Commission as background data for making administrative decisions and as a method of monitoring the state's wildlife populations.

Data from the survey are summarized in Tables I through VII. The top five game species in order of the number of participating hunters were squirrel, deer, rabbit, dove and quail. The top five game species in order of the number of hunting trips for the species were deer, squirrel, rabbit, quail and dove.

As can be seen in Table I, the greatest numbers of sportsmen hunted in Districts 2, 3, 5 and 6. The largest number of hunting trips was made in District 4, and hunters in District 4 averaged more hunting trips per person than those in any other commission districts as delineated in Figure 1.

Tables 3 and 7 show the geographical distribution of hunters, effort, and harvest for these five major game species. Hunters may find it interesting to compare their own hunting experiences with those of other hunters in North Carolina. Hunters who are interested in a particular species may want to plan a hunting trip to an area where the success rate for that species is high.

Deer harvest was highest in the eastern districts (1, 2, 3 and 4). A longer open season and a more liberal bag limit does exist in these districts. The average North Carolina deer hunter made eight deer hunting trips, and one of every 3.1 hunters bagged a deer. An average of 24.5 hunting trips were made for every deer bagged.

On a state-wide basis, the average squirrel hunter made 5.9 hunting trips and bagged 1.4 squirrels per trip. District 5 had the most squirrel hunters, but hunters in District 7 made the most hunting trips for squirrels.

The average dove hunter, on the other hand, killed 3.6 doves each trip and made 4.8 trips during the season, and the average quail hunter made 7.5 trips and bagged 1.9 birds each time out. Rabbit hunters were less successful and only harvested 1.1 rabbits on each of 5.9 trips.

A separate section of the mail survey questionnaire dealt with the duck hunting experiences of North Carolina waterfowl hunters. An estimated 39,562 hunters made 279,934 duck hunting trips and harvested 420,687 ducks during the 1974-75 season. Wood ducks were the leading duck harvest-

TABLE I

Hunter Participation by Wildlife District 1974-75

District	Number of Hunters	Number of Trips	Trips Per Hunter
1	21,748	372,772	17.1
2	41,848	658,402	15.7
3	42,837	590,625	13.8
4	38,883	735,861	18.9
5	40,860	566,419	13.9
6	43,825	527,690	12.0
7	33,610	537,372	16.0
8	34,599	488,960	14.1
9	30,974	367,930	11.9
Statewide	329,184	4,846,031	14.7

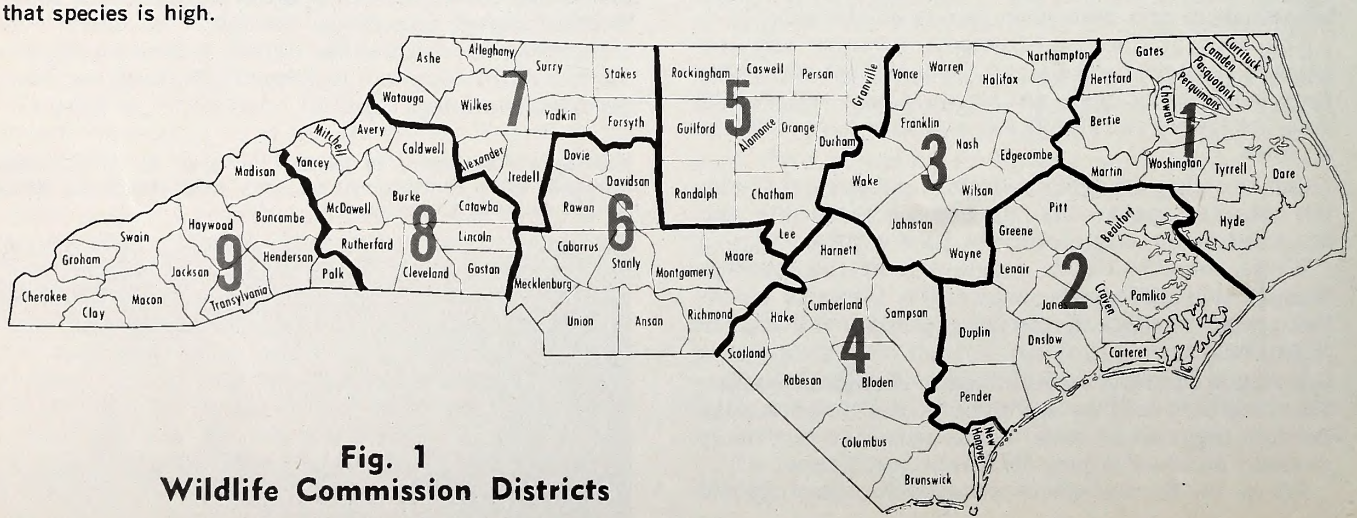


Fig. 1
Wildlife Commission Districts

Table II

Hunter Participation and Success Rate for Major Game Species in North Carolina — 1974-75

Game Species	Hunters	Trips	Harvest	Success Rate	Trips Per Hunter
Squirrel	191,010	1,131,111	1,558,290	1.4 squirrels per trip	5.9
Deer	161,860	1,302,260	53,079	24.5 trips per deer	8.0
Rabbit	161,427	949,244	994,221	1.1 rabbits per trip	5.9
Dove	131,888	627,691	2,276,993	3.6 doves per trip	4.8
Quail	103,833	779,413	1,452,058	1.9 quail per trip	7.5
Ducks	34,278	264,542	420,687	1.6 ducks per trip	7.7
Raccoon	33,964	332,277	208,611	.6 raccoon per trip	9.8
Grouse	16,340	68,492	38,154	.6 grouse per trip	4.2

TABLE III

Deer Harvest by Wildlife District 1974-75

District	Number of Hunters	Number of Trips	Harvest	Trip Per Deer	Hunter Per Deer	Hunter Per Trips
1	12,962	153,667	11,200	13.7	1.2	11.9
2	24,465	270,870	11,465	23.6	2.1	11.1
3	16,688	130,226	10,510	12.4	1.6	7.8
4	18,957	218,780	6,688	32.7	2.8	11.5
5	13,772	115,901	3,609	32.1	3.7	8.4
6	22,197	151,062	3,556	42.5	6.2	6.8
7	18,957	91,158	1,699	53.7	11.2	4.8
8	17,984	93,763	2,176	43.1	8.3	5.2
9	15,878	76,833	2,176	35.3	7.3	4.8
Statewide	161,860	1,302,260	53,079	24.5	3.1	8.0

TABLE IV

Squirrel Harvest by Wildlife District 1974-75

District	Number of Hunters	Number of Trips	Harvest	Squirrels Per Trip	Squirrels Per Hunter	Trips Per Hunter
1	9,923	55,386	81,112	1.5	8.2	5.6
2	22,326	142,420	218,379	1.5	9.8	6.4
3	24,997	150,333	202,780	1.4	8.1	6.0
4	19,273	133,039	140,387	1.1	7.3	6.9
5	27,669	155,984	219,939	1.4	8.0	5.6
6	21,562	94,947	121,668	1.3	5.6	4.4
7	22,707	160,505	216,819	1.4	9.6	7.1
8	21,181	128,856	188,742	1.5	8.9	6.1
9	21,372	109,641	168,464	1.5	7.9	5.1
Statewide	191,010	1,131,111	1,558,290	1.4	8.2	5.9

ed, followed by mallards and black ducks. A total of 64,956 trips, 23.2 percent of the total number for the season, were made during the three and one-half day early segment of the season, and 100,491 ducks, 23.9 percent of the total number for the season were harvested during this segment. Table 8 summarizes the waterfowl survey information.

The staff of the North Carolina Wildlife Resources Commission extends their sincere thanks to the sportsmen who participated in this survey. Sportsmen who may be selected in the future can also assist by completing the questionnaire clearly and honestly and by returning it immediately in the envelope provided. It is only through such public assistance and support that the Wildlife Commission can continue to manage the state's wildlife resources for optimum utilization.

TABLE V

Rabbit Harvest by Wildlife District 1974-75

District	Number of Hunters	Number of Trips	Harvest	Rabbits Per Trip	Rabbits Per Hunter	Trips Per Hunter
1	7,264	36,107	48,668	1.4	9.1	6.8
2	11,623	75,065	68,533	.9	7.9	8.6
3	24,537	151,081	195,666	1.3	10.7	8.3
4	18,403	127,326	141,038	1.1	10.3	9.3
5	27,927	162,484	136,072	.8	6.6	7.9
6	19,371	95,019	116,208	1.2	8.1	6.6
7	22,277	146,330	148,984	1.0	9.1	8.9
8	17,111	94,069	100,316	1.6	7.9	7.4
9	12,914	61,763	38,736	.6	4.1	6.5
Statewide	161,427	949,244	994,221	1.1	6.2	5.9

TABLE VI

Quail Harvest by Wildlife District

District	Number of Hunters	Number of Trips	Harvest	Quail Per Trip	Quail Per Hunter	Trips Per Hunter
1	6,028	41,268	108,687	2.6	18.0	6.9
2	11,641	83,313	166,653	2.0	14.3	7.2
3	17,877	115,238	236,213	2.1	13.2	6.5
4	15,694	133,147	249,256	1.9	15.9	8.5
5	15,383	102,780	195,637	1.9	12.7	6.7
6	13,616	111,345	202,882	1.8	14.9	8.2
7	10,290	76,306	149,263	2.0	14.5	7.4
8	9,043	67,741	115,933	1.7	12.8	7.5
9	4,261	48,275	27,534	.6	6.5	11.3
Statewide	103,833	779,413	1,452,058	1.9	14.0	7.5

TABLE VII

Dove Harvest by Wildlife District 1974-75

District	Number of Hunters	Number of Trips	Harvest	Doves Per Trip	Doves Per Hunter	Trips Per Hunter
1	8,303	36,370	120,560	3.3	14.7	4.4
2	17,924	89,043	309,362	3.5	17.3	5.0
3	19,466	92,806	345,757	3.7	17.8	4.8
4	18,056	99,703	386,702	3.9	21.4	5.5
5	18,320	80,264	272,966	3.4	14.9	4.4
6	21,351	89,043	361,680	4.1	16.9	4.2
7	11,862	68,350	234,296	3.4	20.0	5.8
8	10,807	48,284	170,604	3.5	15.8	4.5
9	5,799	23,828	75,066	3.2	12.9	3.2
Statewide	131,888	627,691	2,276,993	3.6	17.3	4.8

TABLE VIII

A Breakdown of the Harvest by Species and Season Segment

Species	Early Kill	Percent of Total Early Kill	Late Kill	Percent of Total Early Kill	Total Kill	Percent of Total Kill
Wood Duck	45,223	45.0	97,174	30.3	142,397	33.8
Mallard	21,574	21.5	50,605	15.8	72,179	17.2
Black duck	7,470	7.4	26,129	8.2	33,599	8.0
Pintail	5,847	5.8	19,481	6.1	25,328	6.0
Widgeon	972	1.0	27,473	8.6	28,445	6.8
Blue-winged teal	10,960	10.9	7,849	2.5	18,809	4.5
Green-winged teal	3,309	3.3	20,328	6.3	23,637	5.6
Other duck species	5,136	5.1	71,157	22.2	76,293	18.1
Totals	100,491		320,196		420,687	

- Letters
- Comments
- This & That

BACK OF THE BOOK

The Ethics of Hunting

We're in the off-season now, the time when hunters look to the past and the future and wish for better days. Sure, woodchuck and crows are fair game, but for most hunters in most areas hunting is for now a matter of memory and imagination. It's a good time to think about what we do and how we do it, for our conduct afield and the attitude of the public toward us because of it may well play an important role in the future of hunting.

When a fellow picks up his trusty gun and heads for the hunting grounds, he is obliged to obey two kinds of laws. One is the written law that governs seasons, bag limits and hunting methods. But abiding by the written law is not enough. It's the code of honor that the hunter imposes on himself that determines the quality of the hunt. Make no mistake; a man can be licensed and law-abiding, and still never be a sportsman.

For example, the guy who lets fly at a deer more than 500 yards away is legal, but he sure isn't ethical. Again, the hunter who bangs away at geese up in the stratosphere is within the written law but way out of bounds by any honorable standard. In both these cases, the odds against a clean kill are enormous, and the clean kill is the first obligation of anyone who looks at game over a gun barrel.

The ethical hunter understands that he will receive from the hunt in direct proportion to his investment of care, knowledge and respect. He may not fill his limit, but he knows that one bird or animal taken fairly and honorably is better than many brought to bag unfairly. He knows that **how** he hunts is more important than **how much** game he shoots.

And while the nonhunting public may never approve entirely of even the ethical hunter, the public is at least likely to tolerate him. The irresponsible and the outlaw are no longer tolerated by the public, and as long as they remain a part of the hunting scene, we will all suffer by association.

Conservation laws and hunting ethics are two sides of the same coin. We have known for a long time that, without regulation and conservation, hunting would disappear. We know now that without dedication to the unwritten laws, to the ethics of the sport, hunting will just as surely suffer.

National Shooting Sports Foundation

Mouthful

Dear Sir:

On the morning of April 17, 1976, around six o'clock I decided to go fishing in our local club pond for bream so my dog B. G. and I loaded up to go. (B. G. are my dog's initials for Be Good; he's a small, one-half beagle and the other one-half I'm not sure about!)

Anyway, after about 7 a.m., we hadn't done too well on bream so we pulled out to go home. The pond is somewhat off the main road and as I started up the farm road, I noticed a large red fox coming across this freshly plowed field. He had a mouthful of something. I couldn't make it out, so I stopped the car. The fox was then about 40 yards from me and I got out of the car and clapped my hands. He pointed me about the same as a dog on a quail. At this time B. G. got out of the car in hot pursuit. As the fox went under a pasture fence, he dropped his prey which were six grown field rats.

I knew it would be hard to believe so I rushed to the farm house to get Mr. Richard Williams to go and see the pile of rats, but Mr. Fox had been back and got all six rats and was gone within a period of about 10 minutes. We guessed that this fox evidently had a den nearby.

N. L. "Red" Williams
Wilmington

Joan Cone on Cooking Fish

Joan utilizes poaching, baking, and pan-frying to help you avoid turning good fish into bricks or sawdust. Her results are eaten and appreciated by many who claim they don't like fish, but actually don't enjoy dry, tasteless, bone-spiked fish dishes.

Let Mrs. Cone help you transform freshwater fish into tempting, economical meals that don't require fancy ingredients. $1 each, postpaid, from Mrs. Joan Cone, Box 242, Williamsburg, Va. 23185, "HOW TO COOK FRESHWATER FISH."

Your Club and The Community

From Bangor to the Baja, there's probably not a sportsman's club whose membership has not asked itself what could be done to improve community attitudes toward hunting and the shooting sports. Of course, over 3,000 sportsmen's and conservation groups actively participate in National Hunting and Fishing Day each September, but what about the rest of the year?

It doesn't matter whether your club has 500 members and is located on the outskirts of a major metropolis, or whether you are a small town group of 40 or so, there are a number of activities that you can undertake which will go a long way in helping the nonshooting residents of your community understand what hunting and the shooting sports are all about. And the National Shooting Sports Foundation has the suggestions and materials to help your club make an effective presentaton.

Since your club can't set up a soapbox in the town square, finding an audience is your first step. Fortunately, every community has a variety of groups, clubs and associations that regularly schedule meetings or social affairs which often feature film showing, speakers and other presentations by outside groups.

Men's groups in your area might include such fraternal organizations as the Elks and the Moose; civic and service groups such as the Chamber of Commerce, Kiwanis, Jaycees, Rotary and Lions. Women's groups in your area might include the YWCA, the Federated Women's Clubs, the D.A.R., Junior League and League of Women Voters. Other possibilities include the YMCA, PTA, church groups, garden clubs, industrial clubs and the many citizen and neighborhood associations found in most communities.

And don't forget the young people your club can reach through school assemblies, and at 4-H clubs, the Boy Scouts, Girl Scouts, the Cub Scouts and at other youth organization gatherings.

Your club will want to present an interesting and informative program that's sure to stimulate discusson and not yawns. An excellent choice is to develop a film program

using the award-winning motion picture, "A Question of Hunting." Presented by the National Shooting Sports Foundation and Remington Arms, the film is available to your club on free loan. Just drop a note, including the title of the film (Digest #30751) and playdates, to Modern Talking Picture Service, 2323 New Hyde Park Road, New Hyde Park, N.Y. 11040. "A Question of Hunting" is also available for sale from NSSF, 1075 Post Road, Riverside, Conn. 06878, at $98.00.

A good film program includes much more than just a film showing and that's why NSSF has prepared an in-depth film guide for "A Question of Hunting." The guide provides background information on the subject of hunting and the film itself. It discusses ways in which to generate interest in the film and how to introduce it. In addition, it contains a variety of questions and suggestions which will be helpful in leading a discussion afterward.

It's also a good idea to have handout pieces for all the members of your audience. Such material helps generate discussion during the program and is something that each member of the auidence can take home to read. Both NSSF's "The Hunter and Conservation" and "What They Say About Hunting" (which contains statements on the subject of hunting as expressed by 19 major associations concerned with conservation) make excellent handouts for "A Question of Hunting" film program. "The Hunter and Conservation" is available at $9.00 per hundred; "What They Say About Hunting," at $8.00 per hundred from NSSF.

For addtional films, NSSF has prepared "Films on the Outdoors," a listing of over 135 films on hunting and conservaton. For the guest lecturer, NSSF has complete "Speaker's Kits" on hunting and conservation.

NSSF will be happy to send your club free samples of our literature and film guide. Just drop us a note at 1075 Post Road, Riverside, Conn. 06878.

National Shooting Sports Foundation

• continued from page 7

THE BOG TURTLE

turtle should be listed as "threatened" in North Carolina on the Federal list.

The evolution of the bog turtle provided it with characteristics rendering it vulnerable to 20th century man. Being habitat specific for wetlands, of course, is a disadvantage in a society which has not yet developed a land ethic including such environs. Its limited mobility prevents it from expansion into other bogs except at painfully slow rates, if at all. The three to five eggs that the female deposits is significantly lower than most reptiles and probably results in low productivity. Since nature provided it with attractive yellow or orange face patches and a non-aggressive disposition, it has been highly valued for the pet trade.

The response to our calls for assistance in locating bog turtles has been gratifying. Field personnel from the Wildlife Commission and Forest Service have given us data. Dr. Dan Pittillo, botanist, discovered turtles and additional bogs while searching for rare and bog plants, and private individuals have given us helpful data. All of the sources of information are valuable to use so that a bank of data can be quickly assembled. Data regarding adjacent Piedmont colonies is particularly needed and anyone with information is urged to contact the North Carolina State Museum in Raleigh.

The information from some of our cooperators has led to the discovery that at least four types of boggy habitat may harbor turtles. These are the woodland sphagnum bog; alder sphagnum bogs through pastures; open, wet glades along streams; and open pastures with permanent standing water (old beaver dams).

Each of these basic habitat types has a common denominator in clear, meandering rivulets with highly organic muds and detritus. All are generally open so that sunlight easily filters through to ground level plants. Sphagnum, cinnamon fern, sedges, willow, and alder occur in most of these bogs due to moisture, pH, and other factors.

Bog turtles found in the pasture bogs are decidedly larger than those from other bog types and are probably more productive due to higher fertility. But, we can only guess about productivity until we become efficient at locating nests and young.

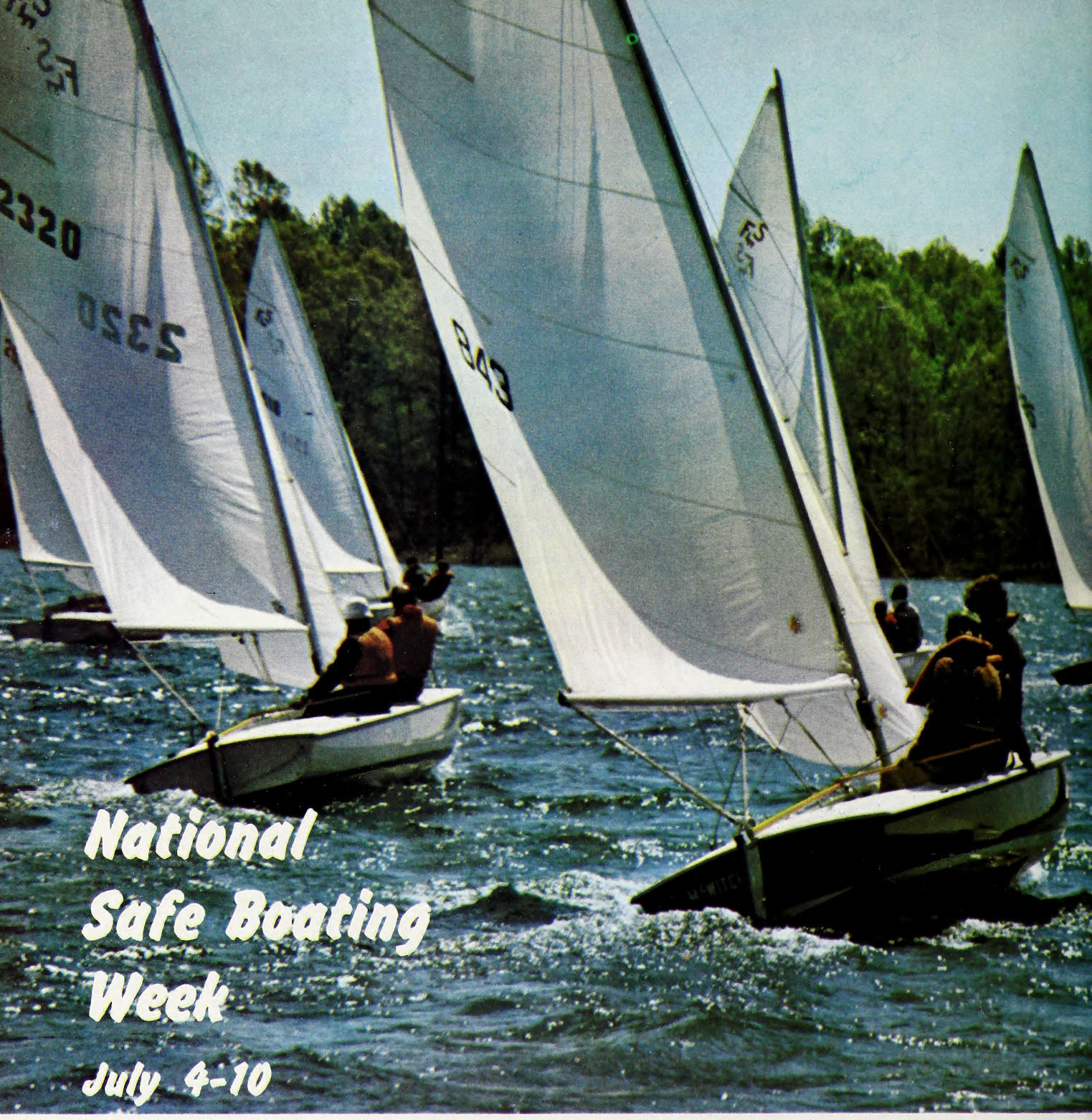
The newly hatched turtles seem to have slow growth rates judging from the few that we've seen. Hatching takes place in the fall, so the young turtles must overwinter largely on stored energy. This may be a critical factor in survival of young through the first year.

In summary, we have made some good progress in bog turtle research during the past two years. Through the cooperative efforts of many people, several colonies have been located and biological information collected which gives us the means to estimate population size. The attention given by the Wildlife Commission through its authority to control collecting permits and action by the North Carolina Committtee on Threatened Species is all good evidence of the will to conserve this rare animal. ⬍⬍

• MANATEES — from page 9

This year staff members of the North Carolina State Museum of Natural History, in cooperation with the National Fish and Wildlife Laboratory, will be doing extensive field work and aerial surveys in southeastern North Carolina in an attempt to better document the status of this animal. If you should see one or know of anyone who has, please report this information to the Manatee Survey, Laboratory, 2820 E. University Avenue, Gainesville, Florida, 32611, (phone 904-372-2571) or to the North Carolina State Museum of Natural History, 101 Halifax Street, Raleigh, North Carolina, 27611, (phone 919-829-7451). With this information we hope to learn more about the seasonal distribution and numbers of manatees summering in our state National Fish and Wildlife and to be able to provide better protection for these rare and interesting creatures. ⬍⬍

MANATEE SIGHTINGS



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Wildlife

IN NORTH CAROLINA

AUGUST 1976

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Barbara Pugh
Chris Marsh '75

resting

The outdoors of lazy August days is made up of many subtle things. And if you're near a quiet pond, the dragonfly is likely one of them. The sparkling wings, oversized eyes, and flitting flight mark this destroyer of mosquitoes.

PHOTO BY F. EUGENE HESTER

National Hunting & Fishing Day
SEPTEMBER 25, 1976

STATE OF NORTH CAROLINA

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Wildlife
IN NORTH CAROLINA ■

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VOL. XL NO. 8 AUGUST, 1976

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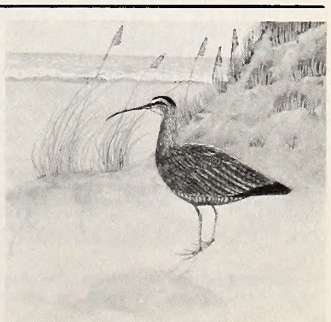
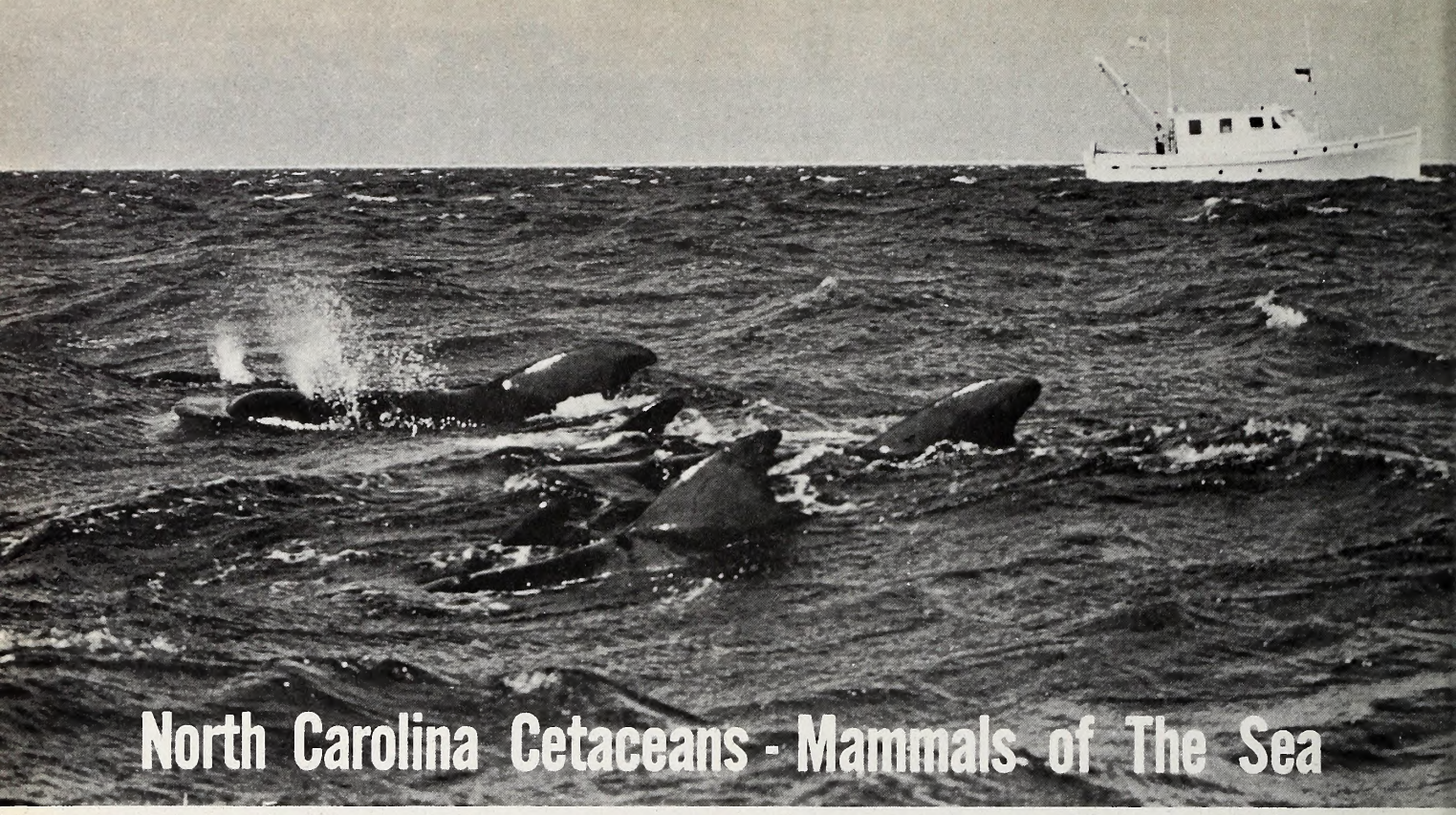
An objective of all levels of government should be to achieve and sustain a balance of the social, ecological, and economic benefits derived from natural resources. Without such balance none of the factors on the scale will be worth weighing.

The shore birds of our coastal area and other waterways, cover a wide variety of species and often form a confusing picture for most of us. The large whimbrel, pictured on our cover, prefers searching the dunes for food in the early morning hours. More of these interesting birds in their varying colors and sizes are presented by artist-writer Chris Marsh on pages 15 and 16. Painting by Barbara Pugh and Chris Marsh.





North Carolina Cetaceans - Mammals of The Sea

SHORT-FINNED PILOT WHALES

PHOTO BY JEFF VAN BUREN

by Randall R. Reeves*

But the whales seemed to stop coming up the coast past Cape Lookout, and there were several years when none at all were sighted. The last one killed was in 1909.

(From *The Outer Banks of North Carolina, 1584-1958,* by David Stick, p. 194)

THE Cape Hatteras porpoise fishery outlasted its whaling counterpart at Cape Lookout, but it, too, fizzled out by the 1930's. In both cases market forces were probably as much to blame as the shortage of game for the industry's demise. However, there is little doubt that marine mammals, and the great whales in particular, were seriously reduced by overhunting along the entire U.S. Atlantic coast.

Today cetaceans (whales, dolphins, and porpoises comprise the mammalian order Cetacea) are no longer considered "game" in these parts. In fact, they enjoy complete legal protection in coastal waters of the continental United States. The federal Marine Mammal Protection Act of 1972 makes it illegal for Americans to harass, capture, or kill marine mammals. Alaskan Eskimos, whose hunting economy is largely reliant on the capture of marine mammals, are exempted from the Act's prohibitions.

Although the rugged Outer Banks are best known as a graveyard for ships, their shores are also sometimes littered with the broken, lifeless bodies of a variety of whales and dolphins. And when such "whale-wrecks" occur, Dr. James Mead, Curator of Marine Mammals at the Smithsonian Institution in Washington, is anxious to be notified. During the past three years he and his technician, Charley Potter, have investigated no less than 30 cetacean strandings on the Outer Banks.

Despite fairly regular reports of large whales being sighted in the area, only two are known to have stranded in North Carolina since 1973. On November 30 of that year an immature, 28-foot male Humpback Whale *(Megaptera novaengliae)* came ashore five miles south of Currituck Light. When a Smithsonian crew arrived on the scene on December 4 the animal was still alive. It died the next morning, apparently of exposure and some secondary complications caused by the trauma of stranding.

On April 5, 1975, a dead 48-foot male Sei Whale *(Balaenoptera borealis)* was found at Corolla. Strands of nylon line around its tail stock and its inordinately large dorsal fin looked strangely familiar to Dr. Mead. After some investigation, he was able to determine that it was the very same animal that had come ashore alive on Cape Cod in Massachusetts the summer before. Coast Guard personnel there had towed the whale into deep water and it apparently survived long enough to make its way to North Carolina before finally stranding for good.

Intermediate in size between the great whales and the dolphins are several groups of toothed whales that rarely get to be bigger than 30 feet in length. Several

*A freelance writer who devotes most of his time to studying and writing about marine mammals.

PHOTOS FROM SMITHSONIAN INSTITUTION

Above are scenes from a now-defunct porpoise fishery for bottlenose dolphins at Cape Hatteras, February 10, 1928. The adult killer whale (below) stranded alive at Kill Devil Hills, September 19, 1974, was towed into deep water and released by the Coast Guard.

Photo courtesy *Norfolk Pilot*

of these medium-sized whales have grounded on the Outer Banks in recent years.

On September 19, 1974, a 24-foot Killer Whale *(Orcinus orca)* was found thrashing in the surf near Kill Devil Hills. Coast Guard workers struggled to help it into deeper water, and the whale finally swam away under its own power. However, its emaciated condition did not bode well for the creature's survival. Such salvage operations are usually to little avail, since stranded animas are generally sick or injured and promptly return to the beach after being towed seaward.

About 50 Short-Finned Pilot Whales *(Globicephala macrorhynchus)* thrust themselves onto the beach at Cape Lookout on October 8, 1973. Patient efforts by Smithsonian workers and North Carolnia Wildlife Resources Commission officials got some of the whales off the beach and swimming again, but about 25 died and were dissected at the site. Numerous subsequent reports of individual Pilot Whale strandings in the vicinity lead one to suspect that the entire herd eventually found its way to the beach and perished. This apparently "voluntary" mass stranding phenomenon, to which Pilot Whales seem particularly prone, continues to defy human understanding. The problem is being studied by the Smithsonian Institution in Washington and the New England Aquarium in Boston. A single short-finned pilot whale, a 15-foot male, stranded at Bogue Island on May 22, 1976.

While Short-Finned Pilot Whales are thought to be fairly common in this area, the first documented record of a Long-Finned Pilot Whale *(Globicephala melaena)* in North Carolina comes from a seven-foot female calf found March 26, 1973, near Nags Head. This record extends the known range of the species southward from Assateague Island, Virginia.

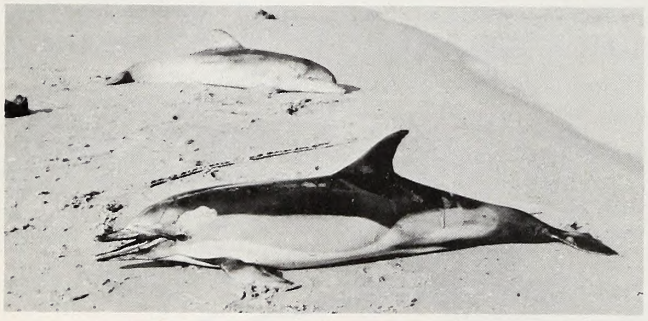
The beaked whales are some of the least well known members of the whale tribe. Four specimens collected in North Carolina during the last three years add to our scant knowledge about their kind. Two Blainville's Beaked Whales *(Mesoplodon densirostris)* have been recovered, one a fresh 13½-foot male found at Cape Hatteras June 14, 1972; the other a 13-foot female that stranded near Buxton on March 3, 1975. A closely related Gervais' Beaked Whale *(Mesoplodon europaeus)* was discovered at Buxton two months later, on May 17. This old female, measuring 15½ feet, came ashore alive but was dead by the time the Smithsonian crew arrived at the site. On May 5, 1976, another Gervais' Beaked Whale, this one a 16-foot female, was recovered from the beach at Bogue Banks.

Pygmy and Dwarf Sperm Whales are the smallest

JEFF VAN BUREN PHOTO

Short-finned pilot whales are loaded onto a Smithsonian flatbed truck for transport to a study site. These were stranded as a group at Cape Lookout, October 8, 1973. Below, a common dolphin (foreground) and bottlenose dolphin (background) found near Corolla in February, 1975.

PHOTO BY J. G. MEAD, COURTESY SMITHSONIAN INSTITUTION



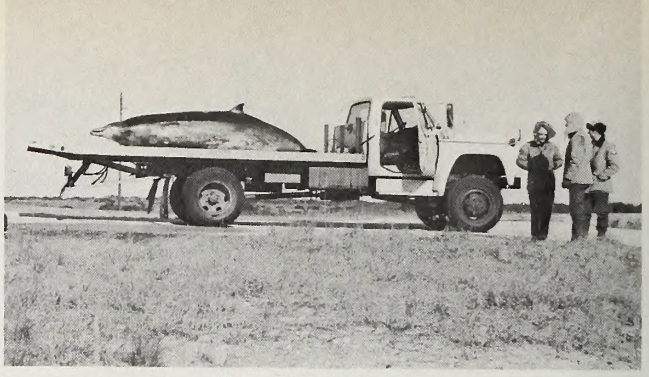
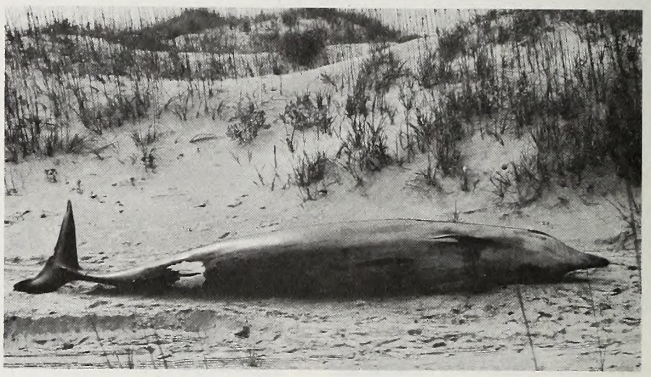


PHOTO BY J. G. MEAD, COURTESY SMITHSONIAN INSTITUTION

A 13-foot Blainville's beaked whale, stranded near Buxton, March 3, 1975, is loaded on a Smithsonian truck to be taken to Washington, D. C. for study. This 15½ foot female Gervais' beaked whale (below) was found near Buxton on May 17, 1975.



"whales." And only the smaller of the two species, the Dwarf Sperm *(Kogia simus),* has been reported with certainty in North Carolina in recent years. A Pygmy Sperm *(Kogia breviceps)* stranded at Avon in December 1969. An-eight-foot female Dwarf Sperm was found at Pea Island Refuge on March 2, 1975. Another one that came ashore alive at Fort Fisher on July 9, 1975, was placed in a local tank and kept alive for a brief period. It was found next to a larger dead whale, presumably also a Dwarf Sperm, which was disposed of at sea. Two more small *Kogias,* possibly *K. simus,* have been recovered, one at Corolla in early December 1974 and the other at South Nags Head on March 11, 1976.

Dolphins are plentiful in this area, and at least five species have turned up on North Carolina beaches in the last three years. Probably the most common is the Bottlenose Dolphin *(Tursiops truncatus),* which supported a sporadic net fishery in the Hatteras area for more than a century. In some years over a thousand dolphins were netted and processed for their oil and hide. This fishery ended in 1929. At least 16 dead *Tursiops* have come to Dr. Mead's attention since November 1972, but this figure probably represents but a fraction of the number that have actually washed ashore on the Outer Banks. In fact, Dr. Mead estimates that no more than about 20 percent of all cetacean strandings on the entire east coast get reported.

After analyzing catch statistics from the Hatteras fishery, Dr. Mead concluded that Bottlenose Dolphins probably undertake a north-south migration along the North Carolina coast, moving northward in spring and southward in fall. Relatively small numbers remain in the Outer Banks area through the summer. During migrations, they often can be seen within a hundred yards of shore.

The Common Dolphin *(Delphinus delphis)* is considered more of a deepwater animal than the Bottlenose, so it is less likely to be observed close to shore. Only two recent strandings are known: a seven-foot female from Corolla that died some time in late February 1975, and a slightly smaller female from Buxton that was found on May 5, 1976.

Striped and Spotted Dolphins are also present in North Carolina waters. A dead male Striped Dolphin *(Stenella coeruleoalba),* about seven feet long, was found at Corolla on December 30, 1974. A 7½-foot female was found at Nags Head in early April, 1976, and another Striped Dolphin of unknown sex stranded alive near Nags Head on May 9, 1976. This species bears a close resemblance to the Common Dolphin, and the two are very difficult to distinguish from each other, particularly at sea. Spotted Dolphins *(Stenella plagiodon)* can be mistaken for Bottlenoses. Adults, however, are covered with black and white spots which make them among the most beautiful cetaceans. A seven-foot female and its four-foot calf were found on the beach at Ocracoke Island in early January 1976.

Risso's Dolphin, or the Gray Grampus *(Grampus griseus),* is the only dolphin with a rounded, rather than beaked, snout. Its gray skin is normally covered with scratches and blotches of white, giving it a rather "battered" appearance. A 9½-foot male *Grampus* was recovered from the beach at Bodie Island, where it stranded in early February 1976.

Other cetaceans that are known to be, or at least to have been, part of North Carolina's marine fauna include: Black Right Whale *(Eubalaena glacialis),* Fin Whale *(Balaenoptera physalus),* Sperm Whale *(Physeter catodon),* Cuvier's Beaked Whale *(Ziphius cavirostris),* True's Beaked Whale *(Mesoplodon mirus),* False Killer Whale *(Pseudorca crassidens),* Rough-Toothed Dolphin *(Steno bredanensis),* and Harbor Porpoise *(Phocoena phocoena).*

Summer Songster

by R. J. Warren and M. D. Russell
Dept. of Fisheries & Wildlife Sciences
Virginia Polytechnic Institute
and State University
Blacksburg, Va.

● During the long, hot days of July and August after many birds have long ceased singing for the year, the indigo bunting, brilliant both in song and appearance, may be seen perched on a telephone wire or on a branch high in a tree conspicuously announcing its presence. A radiantly beautiful bird, the male indigo bunting is only about five inches long and has deep, rich blue plumage. In fact, it is almost entirely blue and actually merits the name "bluebird" more so than does the bird bearing that name. The female indigo bunting, on the other hand, is olive-brown or cinnamon in color with a dull white breast and belly. For this reason she is often mistaken for a sparrow.

The indigo bunting's scientific name **(Passerina cyanea)** literally translated means "relating to a sparrow" and "dark blue." The indigo bunting is in the same scientific family **(Fringillidae)** as the sparrows, grosbeaks, and finches. Unlike the other members of this family, however, the indigo bunting rarely sings in the spring or early summer. Not until the hotter days of July and August is it vocal, after which time it will heartily sing from atop a high perch during midday when other birds are resting in the shade.

No one knows why the indigo bunting waits until the breeding season is almost over before singing most vigorously. Perhaps he waits until after the broods are hatched in order to declare his paternal glee. One thing is for certain, however, by waiting for the hushed setting of mid- to late-summer after other birds have stopped singing the indigo bunting makes his song seem that much more impressive and beautiful.

The indigo bunting's song has been generally described as pleasant and canary-like. It is usually long and varied with notes occurring in pairs of three to five. Their vocalization is difficult to describe specifically for no two indigo buntings have exactly the same song; each has his own unique repertoire.

After having wintered in an area covering the Bahamas, Cuba, eastern Mexico, and Central America, indigo buntings first appear in North Carolina in late April. The males usually migrate slightly ahead of the females, locate suitable habitats, and then establish territories. After the male acquires a mate, the pair proceeds to construct a nest. The nest, a neat, compact cup of grass, leaves, and weeds lined with hair and fine grass, is often found within five feet of the ground in the fork of a small tree or in brambles on a brushy hillside. Indigo buntings usually have two broods, the first in late May or early June and the second in July. Three or four plain, pale, bluish-white eggs are average.

During late spring and early fall, indigo buntings may be found over most of the eastern United States and southeastern Canada. They may be seen in North Carolina as late as mid-October before migrating southward for the winter. During their stay they are found predominantly in early successional stage vegetation types such as thickets, abandoned fields, and brushy hillsides. They are also often found along roadsides and on the edges of fields, swamps, and river valleys. These areas provide the required food and nesting sites for this species. The indigo bunting is primarily a seed-eater, but also consumes an appreciable number of insects such as caterpillars, worms, beetles, and grasshoppers.

Strangely enough, the indigo bunting has actually increased its range and numbers since the colonization of North America. The clearing of forests caused many areas of climax vegetation to be set back to earlier successional stages and thus more suitable habitat became available to the indigo bunting.

In spite of its brilliance, and in part due to its behavior and characteristic habitat, the indigo bunting is quite an unobtrusive bird and is often overlooked. A great deal of patience and skill is required to distinguish the indigo bunting in its natural surroundings, even after its general location is determined by its song.

Undaunted by the noonday heat, the male indigo bunting sings joyously throughout the summer months. Both vocally and visually beautiful, the "summer's songster" brings much joy and gratification to those fortunate enough to behold it. ▲▼

SNAKE!

by Paul Koepke
Durham

EVER since Eden, where, according to Genesis, God cursed that most subtle and guileful creature, the serpent, for its part in the corruption of Adam and Eve and commanded it to crawl forever on its belly in the dust, snakes have stood in a curious relationship to man. They seem, somehow, to have become associated with evil, madness, and horror and even today, as everyone knows, the hidden assailant is a snake-in-the-grass, the liar speaks with a forked tongue, the ingratitude of human offspring is more keenly felt than a serpent's tooth, and the snake's sinuous form glides malevolently through the feverish visions of the delirious.

Everyone is entitled to his phobias, of course. There are those who hit the panic button when a cat appears, those who claw the walls at the sight of a spider, and I even knew a girl who was reduced to blithering idiocy when she found herself in the same room with a fluttering moth; but human fear, hatred, and loathing of snakes is so nearly universal as to make me wonder sometimes if it is not bred into the bones of most of us.

There are parts of the world, to be sure, where the natives would never dream of capering about with gay abandon in the underbrush or the forest, for they have been taught to give the krait, ringhals, fer-de-lance, or black mamba wide berth and to conduct themselves with some probity in snaky environs, but many individuals who have never been in anything wilder than a rose garden and have never encountered a snake in their lives will turn into a pillar of gelatin if a garter snake rears its head. So deep-seated are these largely unprompted and untaught feelings, in fact, that the first action taken by many, if fear is mastered, is to kill the snake, regardless of its species. As a matter of fact, the average motorist, who would swerve to avoid a dog, cat, squirrel, rabbit, or even a Norway rat, for that matter, grasps the wheel firmly when a snake is sighted on the road and steers to kill no matter what kind it is. Apparently, "A good snake is a dead snake," is one of the unspoken mottos of our time, and most citizens feel only that they have done their civic duty by giving a harmless corn snake a taste of steel-belted radials, to the eventual detriment of all concerned.

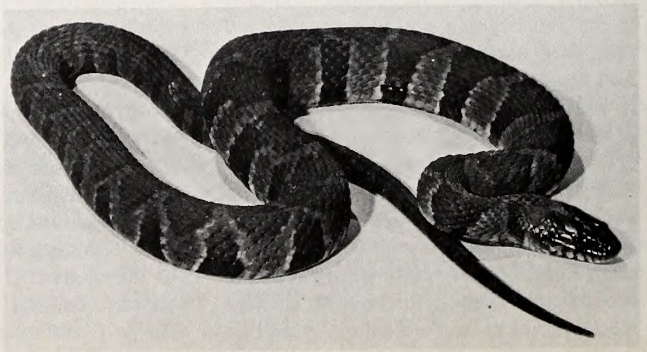
There is a wide variety of snakes in the North Carolina piedmont and we have our share at Two-Moon Pond. Without a doubt the most attractive of the lot is the rough green snake, *Opheodrys aestivus,* that weaves its way through the honeysuckle vines behind the shed and blends so well into the twisted tangle that it is absolutely invisible to the casual passerby. Only people like myself who are given to slouching about in slack-jawed meditation are likely to detect a movement of light, bright, enameled green among the leaves which could not be caused by the wind. It's a gentle creature and we always let him go about his insect-eating business.

Snakes tend to be a secretive lot by nature and we seldom see the terrestrial varieties unless we deliberately go looking for them or something happens to alter their environment, such as the introduction of cattle into the meadow after months of no grazing or the mowing of hay for baling. Then they seem to get stirred up and may appear in our lawn or be observed creeping along on top of the matted, new-mown hay. Heavy rains sometimes flush them out of their hiding places in the ravine as well. In these instances we usually take pains after dark to watch our step in the event that our sole venomous variety, the copperhead, might be abroad and hard to detect.

The one snake that maintains relatively high visibility, however, is the incredible black rat snake, *Elaphe obsoleta/obsoleta,* which seems to be quite careless in the way it exposes itself. No spring would be quite complete without a couple of them slithering across the lawn to the accompaniment of noisy, dive-bombing mockingbirds. They seem to be indifferent to the approach of humans and usually pursue the even tenor of their way even when you stroll along beside them.

The most remarkable aspect of this particular species is its fantastic ability to climb almost anything that has a rough surface. On several occasions one has entered our shed through one of the many crevices in the walls and worked its way up to the top of a ten-foot support post in the south-east corner where it curled itself up comfortably to sleep off and digest whatever it was that bulged like an indoor basketball in its middle. Several individual black rat snakes have used this spot for that purpose, so the news of its location must be getting around somehow.

Unfortunately to most folks, any snake seen in or near the water is a "moccasin," and is deadly poisonous. Caution is fine, but know which is which: this is a non-poisonous northern water snake.



Access to the top of the post is not the easiest thing in the world for a snake to accomplish. The first six feet can be quickly achieved by means of a heavy bracing beam which runs up from the floor at a 45 degree angle, but the next four feet is absolutely perpendicular and doubly difficult on a full stomach, I should think. Nevertheless, the black rat snakes seem to consider it no big deal. Which reminds me that the last one to snooze off a gluttonous orgy on our post top last week was not as stuffed as most and we have just realized that the pair of five-lined skinks that sunned and copulated on our shed stoop this spring have been missing since that time. We fear that they have by now been translated into the bones and supple sinew of one of their reptilian cousins.

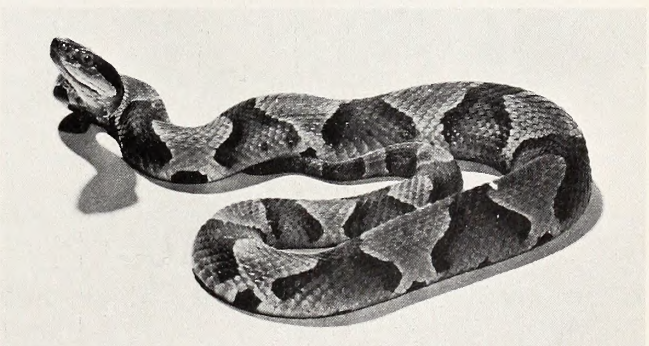
But perpendicular climbing is not the only rouser in this snake's bag of tricks. On one occasion I entered the shed to discover a cast snake skin four and one half feet long draped from a nail point five feet above the floor and looped across various odds and ends including the edge of a pane of window glass. As I examined it I suddenly realized that I was looking at a negative, an everted retrograde, and that this was the backward, inside out chronicle of events. This black rat snake had apparently been crawling along one of the two-by-four horizontal wall braces when he felt like taking off his skin and chose the protruding nail point on which to snag his lower lip. From there on it was just like pulling off a sock inside out.

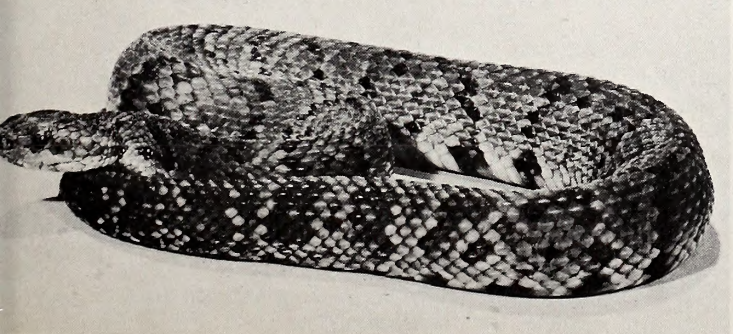
The cast skins themselves tell a good deal about their previous owner; whether the scales are keeled or not, the type of markings it had which are still faintly visible, and whether or not it was a pit viper. If the snake was one of the many varieties of harmless ones, then there will be just two nodes in the dried skin on the top of the head near the tip which indicate nostrils. If, however, there are four nodes, then the two nearest the eyes indicate the sensory organs of the pit viper. Four nodes on the skin's head combined with keeled scales are sufficient in this area to indicate the presence of a copperhead and the faint, ghostly, hourglass pattern is usually visible enough to supply corroborative evidence.

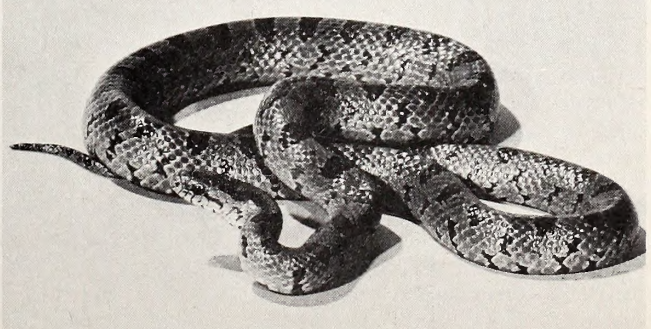
My very first encounter with a black rat snake was something of a shock. I had unlimbered my fly rod one afternoon with the hope of coaxing some bluegills into my fish basket and as I approached the water's edge in the grove at the shallow end of the pond I was startled to see, in a small, sunlit clearing, a large, black snake with an immense greenish horn protruding from each side of its head. At first I was inclined to lay the blame for this herpetological nightmare on the quality and ingredients of my favorite liquid refreshment, but after batting my eyes several times the mist cleared, and I realized that I had just caught a black rat snake at an awkward moment. It had just begun to ingest a sizable frog head-first when I blundered onto the glade, its jaws were dislocated to accommodate the bulk being swallowed, and regurgitation was impossible. As for the hapless frog, he was already halfway down the tube and his legs were sticking out rigidly, one from each side of the snake's mouth. Infinitely relieved that I had been spared delirium tremens, I left the snake to its own devices. When I passed the spot on my way back to the house sometime later it was gone, presumably to a safe, lofty niche somewhere to snooze and restore its tissues.

Black rat snakes are something of a problem for us. They are powerful constrictors and are an immense help in controlling rodents in this area and account in part for the fact that we are rarely troubled with rats and mice in the house. They also share the same diet with the copperheads and compete with them for the available food supply, thus thinning out the venomous snake population. But, unfortunately, they also have a taste for young bluebirds, thrashers, and other birds that prefer to nest within the limits of their climbing ability. On the whole, though, the balance is in their favor, and we allow them the run of the place.

The pond provides a home for only one species of snake as far as we know, and that is the common water snake, *Natrix sipedon.* He is plainly visible at times, zipping across the surface of the water at a good clip and leaving an ever-expanding vee in his wake. At other times he hugs the shoreline, fitting his body to every convolution of the bank as he moves slowly along in search of food. This is the fellow who tries from time to time to work his way into our wire mesh fish basket and woe betide the foolish fisherman who







But in this corner is the real thing: the cottonmouth, which is poisonous. The copperhead (above right) is also poisonous, and probably is our most widely distributed venomous snake. But many snakes, like the harmless mole snake (below right) get most of the blame.

All right now, which is it? What's the difference; you've already got the .22 or the shotgun right on him anyway. But just for the record, it's a common water snake, not a cottonmouth.

settles for a plain stringer for his catch if a couple of common water snakes are around. They will eat his fish dinner for him and hang around for more. One of these snakes, whom we dubbed Long John, frequently passed by our feet as we fished. I found his cast skin in the weeds one day and it measured exactly four feet in length. We are sure he had an appetite to match his dimensions and would raise havoc with any bluegills or baby muskrats he could get hold of.

This snake has more than his share of trouble. To the uninitiated, which includes most of the people who come to fish at our pond, any snake in the water is a cottonmouth water moccasin, and since the poor common water snake bears a faint, superficial resemblance to this dangerous species, the average fisherman will, on sight, grab the first thing to come to hand, be it a tree branch, a cane pole, an oar, or even a shotgun, and proceed to belt or blast away until he has reduced this harmless snake to a meringue. Despite the fact that there are absolutely no cottonmouths this far west of the coastal plain, this flannel-headed water flailer will then parade around with the pitiful remains dangling from a stick and go authoritatively and at great length about the pugnacity of this species and the potency of its venom.

The bystanders, of course, swallow this story lox, shlock, and bagel and if anyone has the gall to point out that it is not a cottonmouth at all, the spellbinder will stalk off in high dudgeon. Obviously, he finds that the dramatic fiction lies far more sweetly on his tongue than would the flat admission of simple fact and, being a fisherman, he loves to tell a good story, true or not.

Unfortunately, the "moccasin" business is quite a muddle and it is not helped a bit by *Webster's International Dictionary* which defines the word as "Any venomous snake (pit viper) of the genus *Agkistrodon*, especially *A. piscivorus* (see WATER MOCCASIN)." And, to make confusion worse confounded, the genus *Agkistrodon* includes the three species of copperheads and, while *A. piscivorus* is the true water moccasin, *A. contortrix mokeson* is the northernmost of the copperhead species. Webster then goes on to define water moccasin not only as *A. piscivorus* but also as, "b. Any harmless water snake confounded with the true water moccasin." As a result, everyone in the eastern half of the United States will swear up and down that they have water moccasins where they live, and I am reduced to muttering, "mokeson-moccasin," to myself and sticking straws in my hair.

But mokesons and moccasins aside, it is *A. contortrix contortrix*, our ubiquitous neighborhood copperhead, that poses a constant threat to our well-being in the warmer months. It is not that these snakes are constantly popping up all around us, but rather that they could be hidden almost anywhere but seldom are. There is where the danger lies, for we unconsciously develop a false sense of security after years of watchfulness only to encounter one where we least expect it. Imagine picking one's way carefully for years around brushy sloughs, rotten logs, and rocky hillsides and avoiding unlighted parts of the lawn at night only to blunder headlong into a large one in the newly mown back yard in broad daylight. Imagine also wading knee-deep, spring after spring, through tangles of Virginia creeper, wild grape, honeysuckle, cow-itch vine, and poison ivy to reach the most luscious of the blackberries and never encountering any snakes at all, and then uncovering a copperhead with the lawn mower in a foot-square clump of grass beside the backyard mulch pile. This happened to be a small one, to be sure, but the female copperhead is a live bearer and her young emerge into the world, like Athena from the head of Zeus, fully armed and ready for business, and their little hypodermic syringes are extremely efficient.

Copperhead bites are rarely fatal but they can be extremely painful and a well placed bite on the ankle can make one's leg swell up like a cottage ham. We once had an acquaintance who was bitten on the middle finger of the right hand. Since, through a misunderstanding, medical attention was delayed, nerve damage resulted and the individual lost all feeling in the finger and all use of it. For me, as a professional musician, something like this would be intolerable, so while we pursue a strict policy of *laissez faire* where harmless snakes are concerned, we dispatch any copperhead who crosses our path without hesitation. But even so, I don't like the odds. There's always another copperhead and, like the water boy in the old song, I don't know where he's hiding. ⬍

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

New Licenses

One last reminder for those who have 1975-76 N. C. Combination Hunting and Fishing licenses: these (and Hunting Licenses) expired July 31. So, if you're ready for some late summer and fall angling, and getting ready for the doves, don't forget your new license.

Carolina Conservationist

The Carolina Conservationist program launched in last month's WILDLIFE magazine is in full swing, and if you'd like to be a part of the venture, a $5 contribution to the non-game program will get you a decal with a small portrait of a red-cockaded woodpecker; a contribution of $25 or more gets you the decal plus a 16 by 20 inch limited edition (1,000) numbered and signed lithograph of a painting of this rare bird.

1977 Fishing Regulations

Public hearings to consider changes for the 1977 N. C. Fishing Regulations will be announced in the September issue of WILDLIFE, but are tentatively scheduled for late September in Asheville, Salisbury and New Bern.

Dove Season and Marsh Hen Seasons

At press time, these hunting seasons were yet to be selected and announced. News releases will be issued prior to opening dates.

Courtesy Motorboat Examinations

The last two such examinations of the season conducted by Flotilla 17-1 are to be held as follows: August 21, at Carolina Campin and Marina, Belews Lake; and on August 28 at Midway Marina on Lake Norman.

National Hunting and Fishing Day

There is still time to work up an effective program for this important day, September 25, 1976. For NHF Day kits, etc., write NHF DAY, 1075 Post Road, Riverside, Conn. 06878.

PHOTO BY LEONARD LEE RUE, III

This raven's nest, built in a rock crevice high above the ground, contained six eggs with their typical "splatter" markings. At least four of the eggs hatched and the naked young seem to be mostly beak and open mouth.

PHOTOS BY THE AUTHORS

THE RAVEN

Symbol of Wilderness

**by Richard N. Conner,
Irvine D. Prather,
and
Jerry W. Via**

Department of Biology
Virginia Polytechnic Institute and
State University
Blacksburg, Virginia 24061

A symbol of the wilderness, the common raven (*Corvus corax*) has aroused the interest of poets, ornithologists, and laypersons for millennia. Their aerobatics are executed with such precision and style that the maneuvers of other species sometimes seem cumbersome. The intelligence and craft of these magnificent birds are apparent in their behavior. When calls of the raven pierce the dawn they engender all that is wild and free.

Ravens are omnivorous but prefer carrion and thus overlap with vultures in their food habits. In areas where ravens are abundant,

In about three weeks, the nestlings have the beginnings of their flight feathers (above). And by four weeks (right) plumage is similar to that of an adult. Head feathers are erected as a defensive display.

they are occasionally seen feeding on dead animals along highways. As common crows feed in a similar fashion, ravens are often mistakenly identified as their smaller relatives. Ravens are about 30 to 50 percent larger than crows. The two species can be distinguished more readily when in flight. Ravens soar to a much greater extent than crows and have a slightly pointed, wedge-shaped tail, where as the tail of a crow is typically quite round.

The social behavior of common ravens during winter may be partially linked to their foraging behavior. Usually occurring the year-round but more pronounced in winter, ravens congregate into nocturnal communal roosts. It has been speculated that these gatherings permit an efficient and complete utilization of food resources. Individuals having knowledge of a food source would be followed by other ravens when leaving the roost in the morning. In that manner they serve as guides to the other birds.

Since ravens do not breed until three or four years of age, the communal roosts are thought to be composed mostly of non-breeders. Some breeding pairs probably comprise part of these nocturnal roosts, but only during the winter. In spring, breeding birds must attend to their territories and nesting activities.

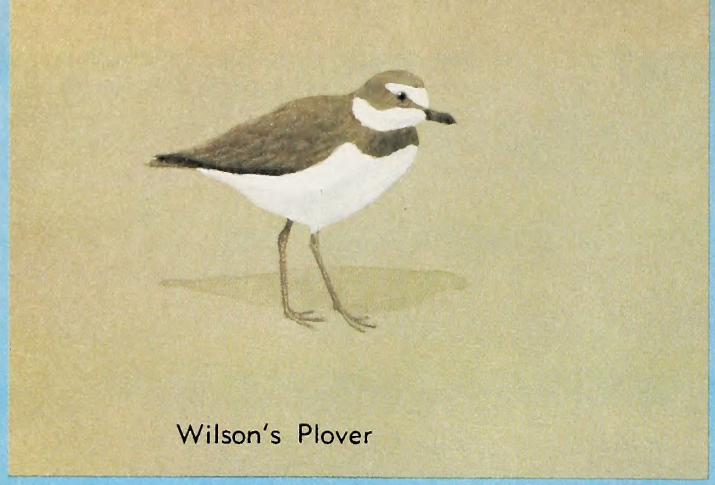
Courtship behavior comes into full bloom during the last part of winter. Ravens are monogamous and perform quite extensively in their courtship displays. Spectacular dives and ascents are basic components of the display. Half rolls and full rolls are seen occasionally. A rare element of courtship occurs when a pair joins feet and soars or plummets through the air for several seconds. Accompanying these aerobatics are a wide variety of vocalizations. Rattles, caws, and bell-like notes are only a small part of the ravens' vocal repertoire.

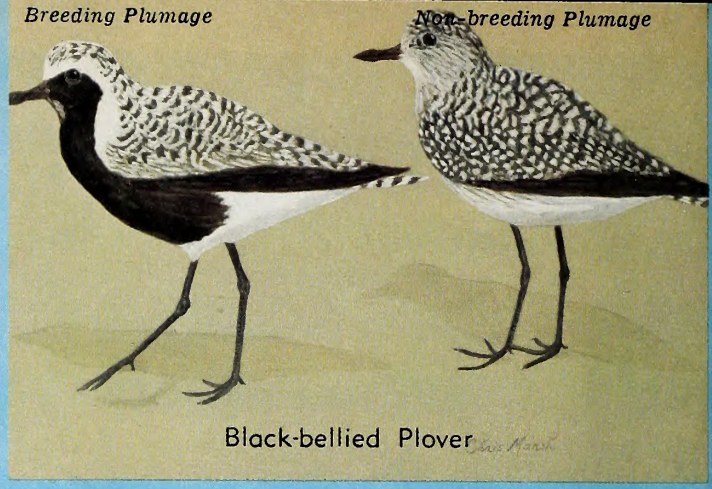
Nest site selection and nest building usually commence in late January and February. The nests are carefully woven with sticks forming the initial platform. Grasses and fur are intricately molded to form a cup-shaped pocket in which the eggs are laid. The combination of the grass and fur provides excellent insulation for the eggs and nestlings. This is necessary since ravens begin nesting quite early in March when nights are still quite cold.

The nests are usually placed in very remote, rugged mountain terrain. Cliff nests are the rule, while tree nests in conifers occur occasionally. The typical nest cliff is between 30 to 60 feet high. Nests are built under overhanging rocks which provide some protection from the elements. Areas around the nests are normally devoid of any vegetation.

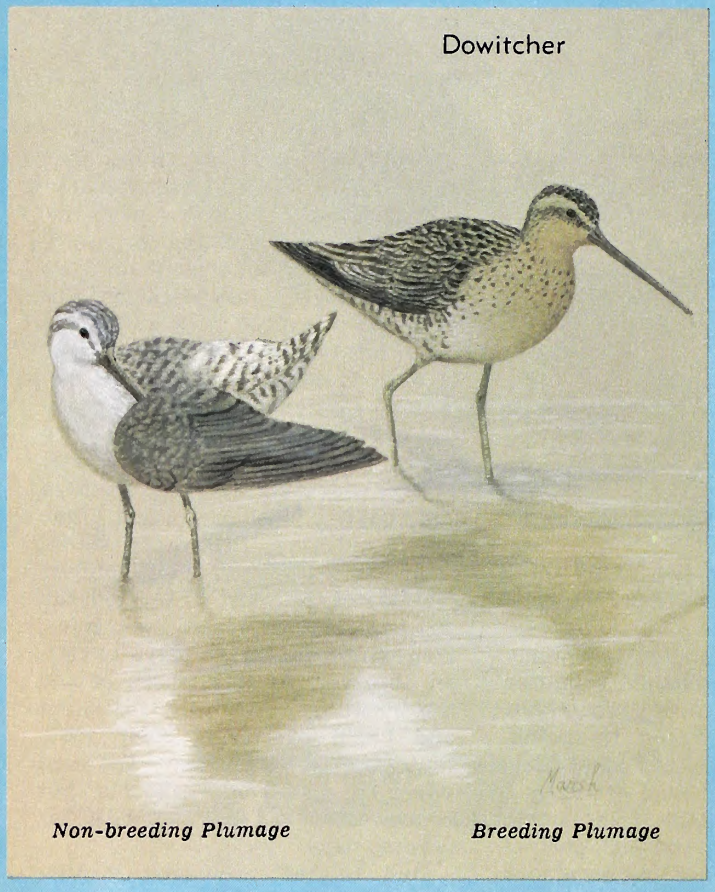
Five to seven eggs are laid in the nest during March. Both male and female share the incubator duties which last about three weeks. The young are naked and helpless and hatch asynchronously as incubation commences with the first egg. At one week old the young are still naked but have doubled their size. When two weeks old the nestlings are quite pink and black down has begun to grow over most of their bodies. Their eyes are beginning to open at this age. At three weeks of age the nestlings are quite active. Down feathers are now well grown and wing and tail feathers are plainly visible. When four weeks old very little down shows as it has been covered by contour feathers of the body. At this age the young begin to recognize enemies, and exhibit defensive plays toward an observer. At five weeks of age the nestlings are fully feathered and begin exercising their wing muscles. The young leave the nest when six to seven weeks old, but remain close to the nest cliff for several days.

Due to the prolonged nesting period, ravens are quite susceptible to human disturbance. Outdoor enthusiasts whose activities bring them close to nesting cliffs might be a potential threat to nesting ravens. Additional threats to the raven are the encroachments of man and his buildings, and their alteration of wild lands. As a symbol of the wilderness, we should be ever vigilant that we do not make further inroads upon the common raven and the wilderness that it represents. ▲▼



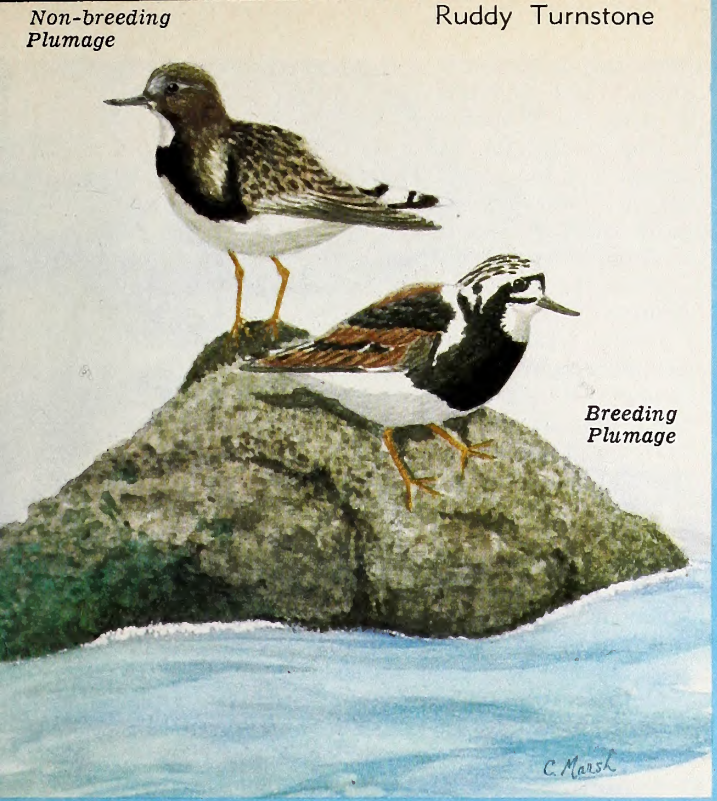


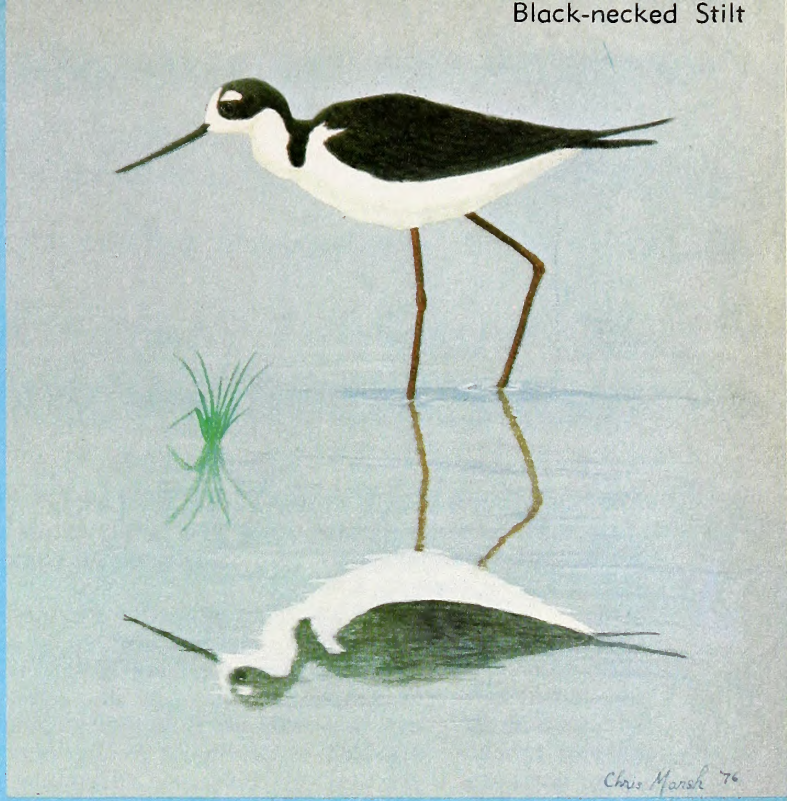
SHORE BIRDS



● Although shore birds may be found in almost any part of North Carolina during migration, most Carolinians come in contact with these birds during summer visits to the coast. The term shore bird refers to those small to medium sized waders like sandpipers, plovers and snipe. A large number of species may be encountered in the state at various times of the year. Forty-two species of shore birds have been recorded in the state in the past decade. Many species use cryptic coloration for protection against predators. The common use of background shades of brown and gray make these species appear similar, especially to the untrained observer. In contrast, the coloration of other species, such as the oystercatcher and the stilt, is striking.

Besides the shore bird's coloration, the size and shape of the bill is often important in identification. Bills vary according to what the shore birds eats. Shore birds with short bills feed on tiny animals (invertebrates) on or just below the surface of the mud or sand. Long-billed birds such as dowitchers and snipe can reach invertebrates living deep in the mud. Certain shore birds have highly specialized bills to feed on a certain food. Oystercatchers can use their odd-shaped bill to slide into partially-opened oysters and cut the muscle that closes the shell. This leaves the





TEXT AND PAINTINGS BY
CHRIS MARSH

oyster helpless and the Oyster-catcher with a tasty meal. The pigeon-shaped bill of plovers makes a poor probe so these birds usually feed on drier ground searching the surface for food.

Most species of shore birds nest in the high Arctic. Since the snow does not melt on the tundra until late May, some of the plovers and sandpipers are still migrating through North Carolina in early June. The adult shore birds start their southward migration as soon as the young are able to fend for themselves. By mid-July many of these Arctic nesters have returned to our state. The young of the year wait and migrate in September after they have had a chance to build up their flying strength and fat deposits. Migrating shore birds are either coming or going through North Carolina during most of the summer. Some individuals may not migrate north to nest at all, but remain along our coast the entire summer. These birds retain their washed-out coloration. This coloration makes the bird blend with the beaches and mudflats. In contrast, breeding plumage blends in best with grassy habitats of the tundra. The difference between the winter and breeding plumages is sometimes great. The black-bellied plover offers a perfect example.

Common northern breeding shore birds that migrate

• **continued on page 27**

Stem to Stern

BY ED JENKINS

● Do you use your boat exclusively for fishing?

Or does the same rig also serve as a family cruiser, a tow boat for water skiers and, occasionally, a workboat?

Many do. And picking the right propeller for these changes of pace can give an old rig new life.

Consider, too, that many new propellers have been developed in recent years—propellers in new sizes, shapes and materials that will do things that your current propeller could never do.

For instance, there are now teflon-coated stainless steel propellers (SST's) available for bigger outboards that can increase boat speed as much as two miles an hour and are virtually indestructible.

The experts at Johnson Outboards compare propeller types with the gears on a car. There are some propellers for speed, others for heavy hauling.

You need "low gear" for pulling away from the dock with a load of people and picnic gear. But it takes "high gear" to get top acceleration when you're zipping along in a nearly empty boat.

In both cases, the propeller simply throws water to the rear, causing the boat to move forward. The difference is how much water the propeller is designed to affect with each revolution.

The greater the throw, the faster the boat moves—unless it is too heavy. Then an undue strain is exerted on the motor, like forcing a heavily ladened car uphill in high gear.

The answer lies in the propeller's diameter, its pitch (amount of twist in the blades) and the number of blades.

Blades with low pitch throw less water, letting the propeller spin with a minimum of strain. This is recommended for heavy craft. Lightening the load enables the prop to throw all its muscle against the water, and maximum speed is gained with a high pitch propeller that takes a deep bite in the water.

If you have a racing hull, a "wheel" with two blades steps up the speed even more. For general service, though, most boatmen use a prop with three blades.

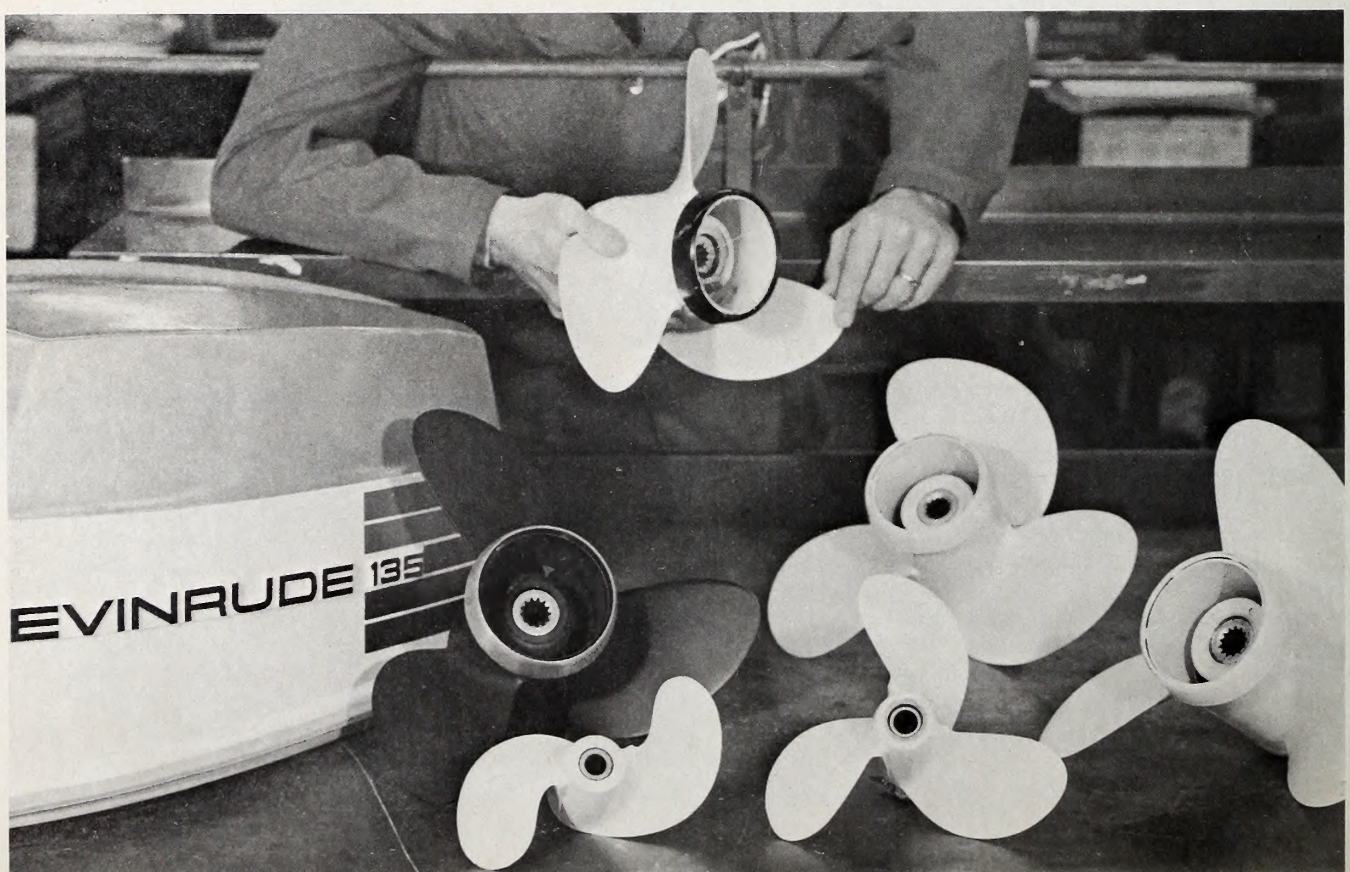
The propeller's diameter also figures in how much water is thrown. But you face no decision here, because most outboard motors use the biggest propeller possible that will clear the cavitation plate.

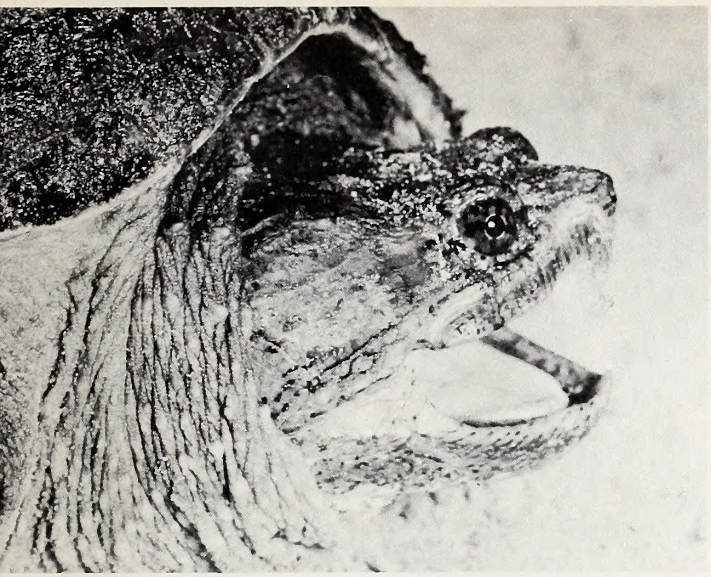
Making up your mind about pitch is simplified by a chart issued by outboard manufacturers. It shows recommended propeller pitch and blade number for various combinations of boat length and weight.

A tachometer can be very valuable in selecting the right propel er for your boat. By trying a propeller and comparing the engine's top r.p.m. against the manufacturers recommended range, one can select the propeller that is best suited to his boat. Generally speaking, use the propeller pitch that enables the engine to develop its top-rated r.p.m., because it's here the engine will be delivering top horsepower.

Mounting the propeller that's right for the job will help give you more fun on the water than ever before. ▲▼

To obtain maximum performance from your boat and motor, it is imperative that the correct propeller is installed on the motor.





Give Old Mossback A Try

by John A. Crew

SNAPPING turtles are usually given little thought by N. C. sportsmen except perhaps as an occasional nuisance to bait fishermen or a minor hazard to power boaters. Suggest dining on old mossback and you're given looks normally reserved for carriers of dread diseases.

How erroneous these attitudes! In at least three areas within their natural range, snappers have long been known for their culinary qualities, which incidentally makes connoiseurs drool with anticipation. The eastern Shore of Maryland, the South Carolina Low County and the Louisiana Bayou are places where turtlin' rivals conventional hunting and fishing activities because old mossback is the main ingredient in a variety of dishes.

Snappers are found throughout North Carolina with the possible exception of the higher mountains. They are very numerous in eastern Carolina. While snappers do hibernate during mid-winter, they are frequently seen sunning on warm January and February days. Any permanent body of fresh water large enough to support them will harbor snappers. Slow moving streams, swamps and ponds are preferred habitats. Most turtlin' is restricted to the warmer months when they are more active.

There are two popular methods of taking snappers: with traps and with set hooks. A few hardy, reckless souls "grabble" for snappers by feeling, with unprotected hands and arms, under roots and overhanging banks! Once a snapper is located he can be gently removed without fear of bites as long as he's kept under water, so advocates of this madness profess. I'll take their word for it, since this method isn't recommended for the novice.

Traps are floating wood and wire affairs designed to attract old mossback to a bait container within the trap. Once inside, the snapper can't get out, but still remains alive until removed. Most commercial fishermen after snappers choose traps since they don't need attending as frequent as other catching devices. Traps can also account for many turtles with one baiting; however the cost, bulk and time required to make traps may not be in line with benefits.

For the average turtler who just wants a couple for his own use, by far the most convenient and simplest device is a set hook. Simply attach a heavy hook to a two-or three-foot piece of strong nylon chalk line and you're in business. Don't use too much line since old mossback can then wrap around underwater obstructions for leverage and pull free. The loose end is then tied to a tree limb and the baited hook thrown overboard. While snappers will eat just about anything, pork liver cut into 1 x 2 inch strips seems to work fine as a bait. For a five or six acre pond, 40 sets will give good results. The best time to bait up is just before dark since snappers are more active at night. Check each set early the following morning because the longer a snapper is hooked, the better chance he has of getting off. (Incidentally, prior to fishing, it's good idea to check with friends or local fish houses as sources for excess snappers. Often you'll catch more than you need and you should have a source lined up for disposal.)

When removing a hooked snapper, be very careful to avoid his powerful jaws; they can easily sever a finger. If you plan to dress your catch soon, a .22 calibre pistol will dispatch him quickly. If you plan to keep him a while or market him, he must be kept alive, so carry a burlap bag or similar container for transportation. Live snappers can be safely lifted by their tail if held away from your body and legs. Again, be **very careful** since snappers can inflict serious bites.

If you haven't already dispatched your snapper,

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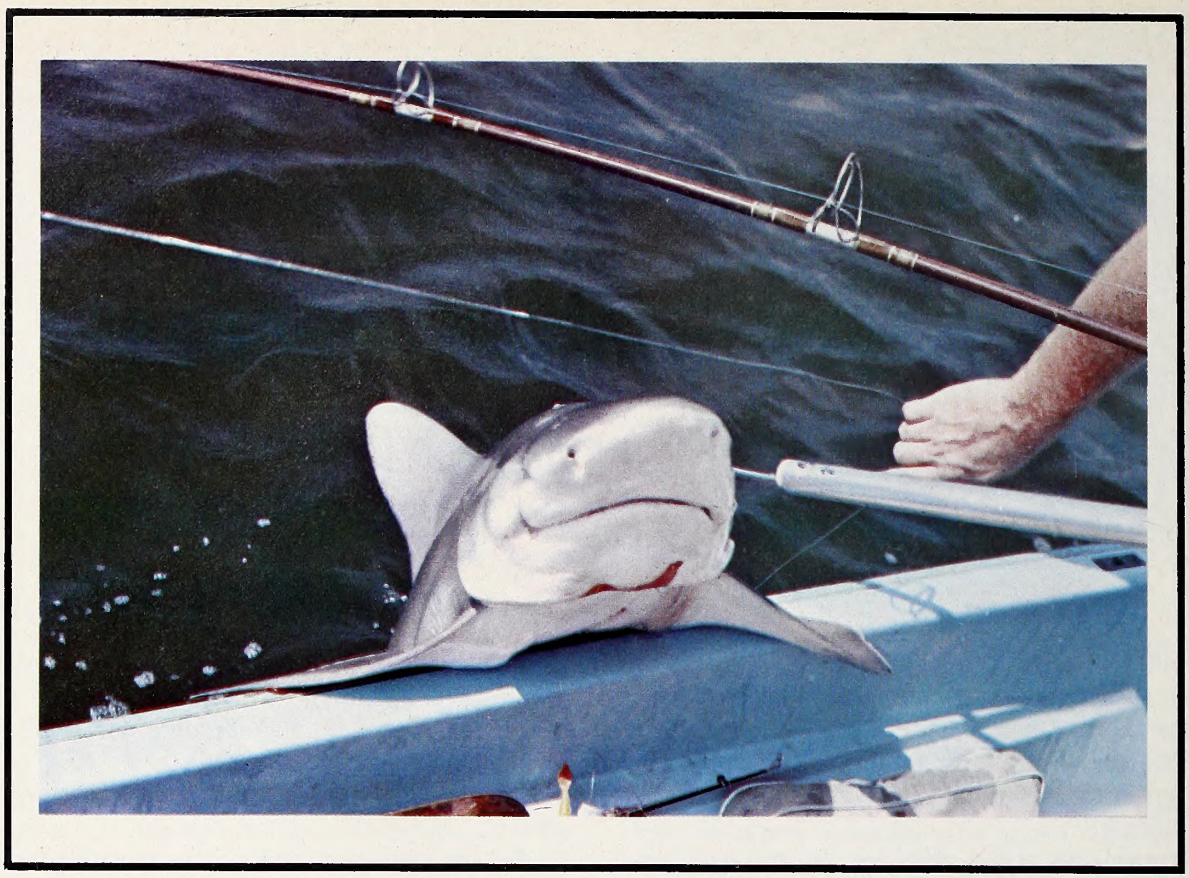


SHARK

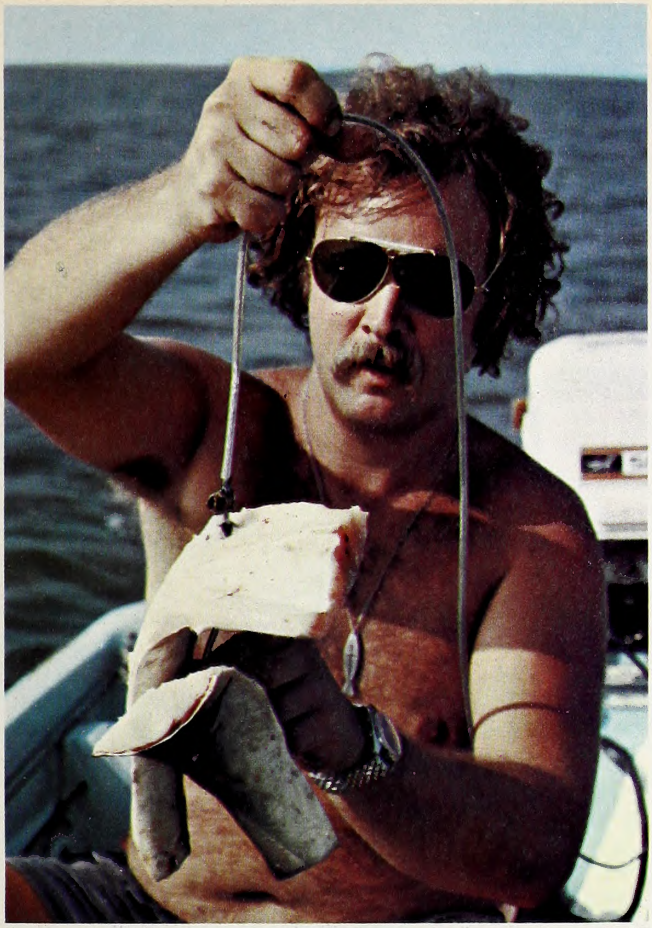
by John Crew
Photos by The Author

RECENT books and movies, both scientific and popular, have generated considerable interest in sharks. The sight of a large, dark shadow lurking beneath the surface with triangular fin knifing the water evokes immediate fear in man. While it is true that humans have actually been attacked and devoured by sharks, many unnecessary fears result from an uninformed or misinformed public. Nonetheless, sharks historically have been labeled as evil and villainous inhabitants of our seas.

The North Carolina Department of Natural and Economic Resources, Division of Marine Fisheries published a booklet in February, 1975, concerning sharks in North Carolina waters. The booklet also serves as an identification aid and is an excellent resource document. It is available for a small fee from their office, P.O. Box 769, in Morehead City, N. C. 28557.

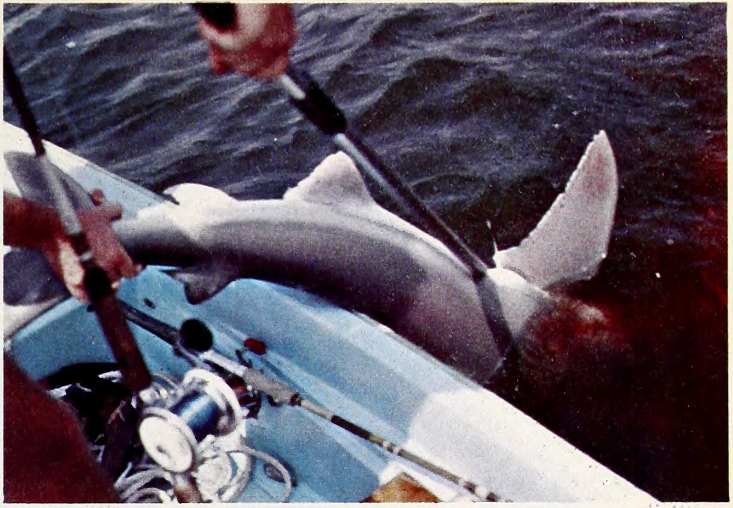
Sport fishing for sharks, long practiced in many oceanic areas of the world is growing in popularity in the southeast coastal states including North Carolina. When hooked, sharks have many of the characteristics that the more exotic game fishes do. Due to distribution, sharks frequently are available at less cost than other game fishes. If a few precautions are taken, one doesn't even have to charter a boat to catch sharks.

Sharks inhabit North Carolina sounds,



Yes, this is the bait! The hook looks something like a superstrong coat hanger hook. But these and heavy cable leaders are needed, because this is what you're dealing with (below).

bays, inlets, capes and mouths of rivers. Although an elaborate rig isn't necessary to take sharks, some fundamental, strong equipment is required. While some sharks are landed from shore, the best fishing is done from boats; craft in the 16 foot-class are adequate for tackling smaller sharks. Large, heavy hooks, wire leaders, heavy test line and stout rods and reels are minimal tackle for sharks and obviously if you



Be sure that the shark is either completely exhausted or has been "dispatched" before you bring him aboard. Even these "small" (75-100 pound) dusky sharks can make trouble in the boat.

are seeking the larger species, much heavier tackle will be necessary. Gaffs are also required plus some device for dispatching the cartilaginous fish. Large caliber pistols, shotguns or clubs are all used, but extreme care is required.

As in other fishing, there is a wide assortment of baits available and preferences vary with fishermen. Since sharks appear to be attracted to flesh and blood, many fishermen use freshly caught fish as bait. Time-proven baits include everything from pig meat to mackerel. Usually some inquiries in the area you are planning to fish will give you an idea of local preferences.

While shark fishing can provide great and exciting fishing, there are some realistic hazards. Certainly the potential for being bitten by a shark is there when one fishes for them. Exercise extreme caution once the fish is near the boat and dispatch him as quickly as possible. If you are in a small boat, make absolutely sure he's dead before bringing him aboard. There are severe consequences, (from both ends!) awaiting those who bring aboard a shark that is still thrashing about.

Due to the obvious hazards, any shark fishermen should also avoid fishing for sharks in close proximity to swimmers or bathers. In fact, many piers prohibit shark fishing due to these hazards and at least one town in North Carolina has an ordinance prohibiting all shark fishing from shore. You better check local regulations to be sure.

BETTER TROUT STREAMS

by Robert Carter
District Conservationist
USDA-Soil Conservation Service
Bryson City

YOU don't find much better trout streams than the cold waters of mountainous Swain County, in western North Carolina right up against the Tennessee state line.

But increasing numbers of humans, with their various works and projects, can cause problems even in trout streams. So it's quite proper that human resources — money, workers and professional assistance — are being used to "improve on nature" and restore the pristine quality of these streams.

Trout fishermen are strongly in favor of the program.

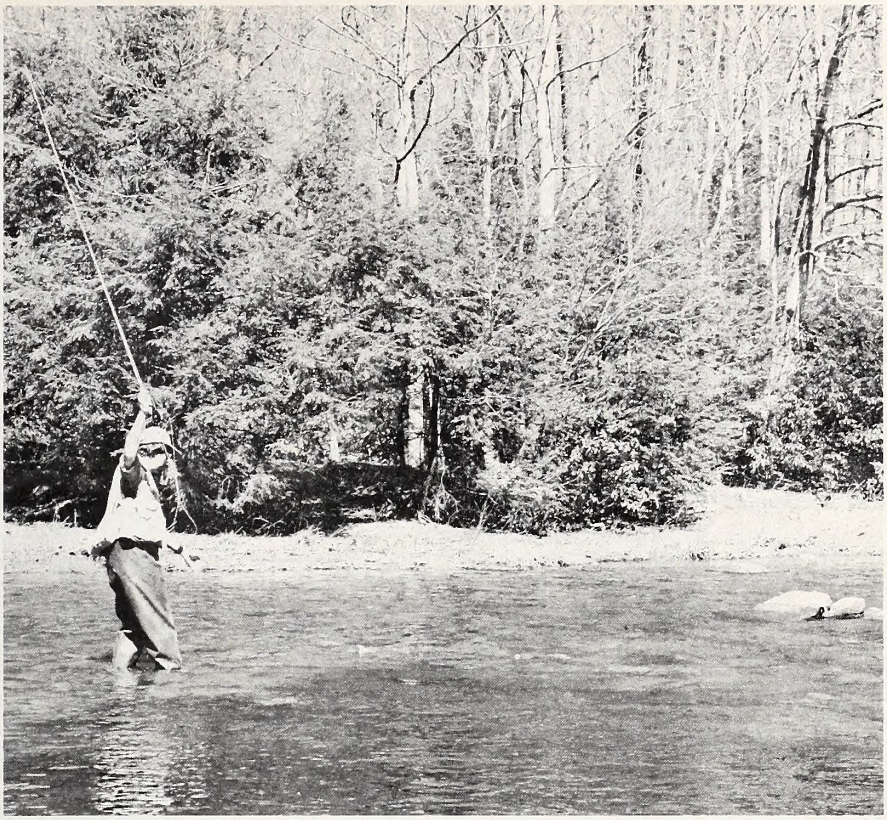
The clean-up is made possible by several factors. First, a problem was seen. Then came a one-year grant of $75,000 in Title X Emergency Job Program money, made to the Tuckaseigee Soil and Water Conservation District. The district works continuously with professionals of the USDA-Soil Conservation Service and other agencies to promote water quality, so the program was a "natural" for this group of elected volunteer leaders.

The funds — provided because Swain County has a high rate of unemployment — were earmarked to be used for improvement of trout habitat.

The work is being done in two parts. First, a crew of seven men went to work on stream clean-up— and this will continue for the entire year. Since the work began in September, 1975, more than 40 miles of stream have been cleaned. The first work was done on streams needing it most; valuable technical assistance was provided by Bill Bonner, fisheries biologist with the North Carolina Wildlife Re-

USDA-SOIL CONSERVATION SERVICE PHOTOS

Tuckaseigee Soil and Water Conservation District's Title X crew work on Alarka Creek in Swain County. Rock is placed on a field fence to hold a log dam in place. Below is some of the trash the Title X workers removed from Alarka Creek.



Rock covered log dams help create scoured holes for trout in "flat" portions of the stream. These structures must be well anchored to withstand the force of the swift stream. The end objective is a better place for fish to live, cleaner streams for all to enjoy and better fishing for years to come.

sources Commission, who works in Swain and several other western North Carolina counties. He helped select streams needing work first.

The second phase, started while the first was continuing, consists of such structural measures as log spillover dams and swing deflectors (which deflect the current in the streambed to create an artificial meander) to provide better habitat and cover for trout and other fish in the streams. Bill Bonner told the workmen how to construct these dams and deflectors. More than 50 have already been installed, with work moving ahead steadily.

Overall conservation assistance was provided by the USDA-Soil Conservation Service.

Chairman P. M. Brendle of the Tuckaseigee Soil and Water Conservation District outlined objectives of the program.

"First, we're going to work on as many streams as possible in Swain County. Naturally, we're going to tackle those which will benefit most from the clean-up and structures for habitat.

"Then we're going to continue and see how many of our streams we can do while the program and the federal grant last."

One problem in the streams is silt—disturbed land, ranging from homesites to roadbanks, can dump thousands of tons of silt into trout streams each year. Most of the banks in this mountainous area are quite steep, and not easy to control by vegetation. To help solve this problem, a hydroseeder — a device which sprays a mixture of seed, fertilizer, other chemicals and mulch material — has been purchased, and is being used to establish growth of protective grass and other vegetation. Use of the hydroseeder is already preventing such siltation.

Biologist Bill Bonner is already pleased with progress that has been made, with many streams visibly cleaner and protective structures built for trout habitat. "It's going to boost the trout population right away," he says.

Chairman Brendle sees a variety of benefits from the Title X work. "Not only will it mean cleaner water, and direct benefit to the trout that swim in that water," he comments, "but it will improve wildlife habitat in general, including small game and birds. It will also mean less erosion, precious soil saved, and a general improvement of environmental quality. And after all, that's what soil and water conservation is all about."

Benefits of the trout stream improvement program, like all programs of the U. S. Department of Agriculture, are available to everyone, without regard to race, creed, color, sex or national origin. ⬍⬍

Shots Seen—Not Heard

THE MAKING OF A PICTURE HUNTER

by Linda B. Walters
Raleigh

Breathe lightly. Walk softly. Spot your prey. Position yourself. Ready. Now — Shoot!

FOR camera buffs like me who sometimes actively search for—and sometimes just "stumble upon wildlife, hunting with a camera can be a real "shooting" sport. What a sense of excitement to press the shutter and realize that you "got one—a good one." And, if you have taken good aim, you may have captured an egret on the wing, a rabbit munching the last green blades of summer's grass, a duck stretching its wings in a glistening pond, or a groundhog sunning in an open space —captured on film to be seen and enjoyed again and again. Hunting animals with film is fun, but it requires some stamina and a great deal of patience, for most wild animals and birds do not care for the intrusion of man; their natural inclination is to run away.

But wildlife abounds in North Carolina, and aren't we fortunate that it does. "Along the way take time to smell the flowers" is a good phrase, and to that we might add "take time to watch the animals," for in doing so, perhaps we can better understand our relationship with nature. If we take the time to look, our own backyard may be full of life—squirrels scampering up and down trees, myriad insects, and a variety of birds fluttering about. North Carolina has many beautiful forests, fields, and rivers. Some of us city dwellers mostly view "forests" of smokestacks that rise up from the city skyline, "fields" of factories sprawling here and there, "rivers" of concrete where traffic moves day and night.

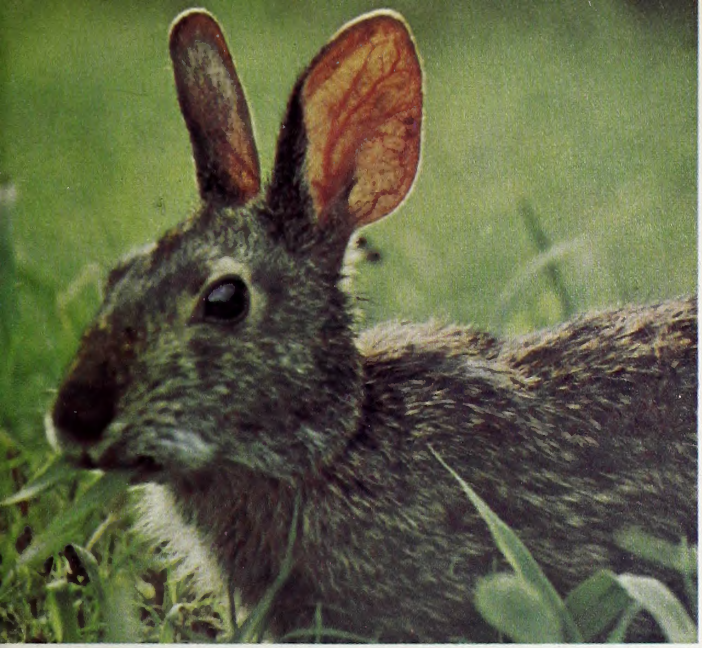
But a Sunday afternoon drive into the countryside or a visit to one of our numerous state or national parks can offer us a place to observe wildlife even in today's crowded world. All North Carolina state parks are wildlife sanctuaries. Because hunting, trapping or the molesting of birds or animals is prohibited there, hunting with a camera is made even better.

If you are a beginning photographer wanting to "shoot" wildlife, you can begin your expedition with just a few pieces of equipment. Your expenses can be relatively small depending on what type of camera you purchase—which in turn determines the kind of film and accessories you will need. For my hunting trips, I carry along a few pieces of equipment which I consider to be essential—a camera, boxes of film, camera bag, tripod, and cable release.

There is a variety of cameras on the market from which you may choose—ranging from the small Instamatic, to Polaroid, to rangefinder, to single lens reflex (SLR), to twin lens reflex (TLR) cameras. Shop around and compare prices for a reliable camera. Choose one that meets your needs. But keep these points in mind: (1) the weight of the camera and lens; (2) the focal length of the lens which determines your angle of coverage; (3) the speed of the lens which is indicated by the smallest "f" number—meaning the largest aperture opening of the particular lens; (4) the range of shutter speeds; (5) the metering system within the camera; and (6) the ease of focusing. If you are interested in close-up photography, you might wish also to invest in a telephoto lens. Again, there is a variety of makes and models from which to choose, and shopping around to compare prices may save you some money. But the best will be expensive.

A camera bag is not a "must," but it makes for a convenient way to keep up with standard equipment and any accessories which you may obtain—extra lenses, filters, cables, boxes of film, flash attachments, lens shades, and light meters. A camera bag also protects sensitive equipment from dirt, water, humidity, heat, cold, sand, and wind. Whether you decide on a vinyl, leather, or cloth bag, choose one that has sides thick enough to protect your equipment from jolts. Select one in which you have "room to grow" because more than likely if you get bitten by "the camera bug" you will be adding to your initial investment.

For taking pictures of animals in wooded areas where lighting may be dim, I use a tripod and cable release



Lighting is often the difference between an average photo and an exceptional one. This rabbit was slightly backlighted, giving the ears an unusual effect.

Be ready for the unexpected, like this squirrel in the ceramic bird house. Or the discovery of a woodchuck sunning himself among the rocks may make a memorable shot.

with my 35mm SLR camera. These items promote stability and enable you to shoot at low meter readings and get a focused picture. For instance, it's difficult to hand-hold a 35mm camera at a shutter speed of a 30th or less and get a picture that is not blurred. Tripods, too, come in a variety of models, sizes, and prices. Some features you might look for in selecting a tripod are these: (1) portability and light weight; (2) easy extension of the legs; and (3) a crank-operated geared elevator for raising, lowering, and tilting the camera.

If you are interested in macro, or extreme close-up photography, a tripod is a must. Some tripods have a head mount which can be taken off the top of the crank shaft and converted to the bottom of the crank shaft for close-up photography. In shooting at very low meter readings, a cable release is a requirement because the least movement of the camera at low settings can result in a blurred picture. Cable releases are available in several lengths and are relatively inexpensive. But, if you prefer not to take along a tripod, and you have a steady hand, you can brace yourself against a tree or rock when shooting at a low speed. Or, make a tripod of yourself by bracing the camera against your body and remain steady while taking your photograph.

The type of film you purchase will depend on the type of camera you have and whether you prefer color prints, color slides, or black and white prints. It is up to you; each has its own attributes. Know your film and what to expect in the final "product."

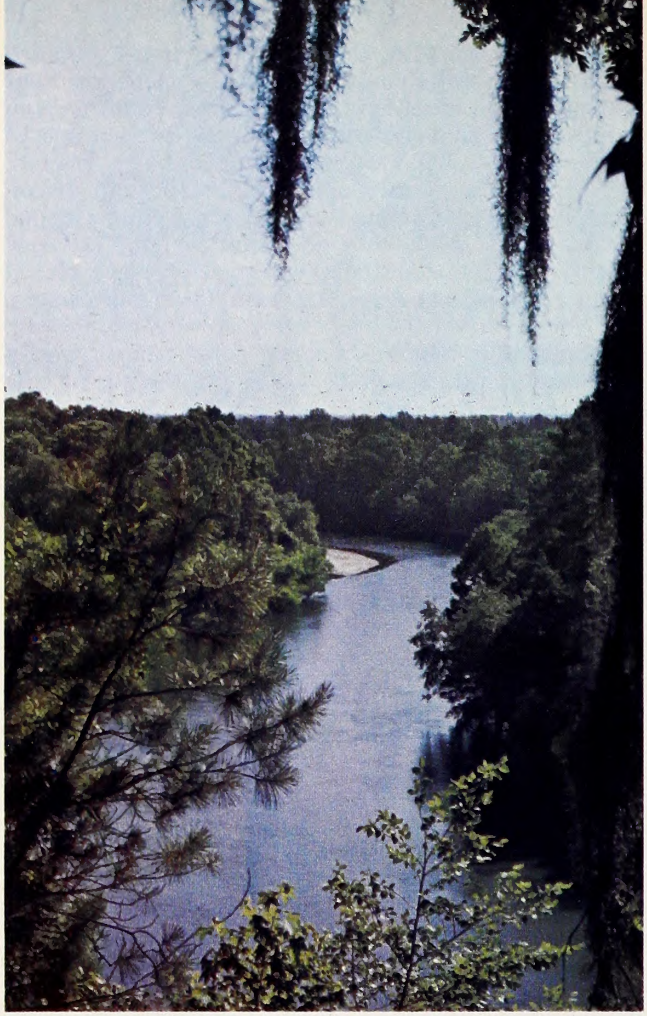
Photography is a science of light, and films are rated according to their sensitivity to light. The film rating, or speed, is called the ASA. The ASA number is usually printed on the box of film, and many cameras have a dial so that you may set your camera for the correct ASA number and thus correct exposure (for "automatic" exposure cameras).

There are three basic categories for film speed: slow, medium, and fast. Slow speed film (e.g. ASA 25—ASA 80) means that it takes a lot of light to properly expose the film. This type of film has very fine grains for sharp detail. If you use a slow speed film, you can enlarge the picture size and still have a good quality picture that is not grainy. Medium speed film (e.g. ASA 100—ASA 125) has medium size grains on the film negative which means that you can enlarge the picture and still get a fairly good quality print.

Slow and medium films are good to use in situations where there is already a lot of available light such as the beach, sandy areas, and snow scenes. In wildlife photography, you generally need a faster film speed (e.g. ASA 160—ASA 400)—and a longer focal length lens because animals tend to stay in shaded areas. High or fast speed films require less light and are good for low light situations. Fast films have larger grains, and one disadvantage to using fast film is that when you enlarge a photo to exhibit size, the picture usually will be grainy. As a rule-of-thumb, slower films give more brilliant color and finer grains while faster films allow you to shoot in tough lighting conditions with some loss of quality. You may need both at various times.

On most boxes of color film, you will also discover that the label types the film as daylight or tungsten. Daylight film is for shooting pictures outside; it has a bluish or cool tint. If you use daylight film for inside shots, and do not use a color correction filter, your picture will have a bluish overtone. Tungsten film is

• **continued on page 27**



AROUND THE NEXT BEND

by Christopher D. Turner
Cary

WE started our canoe trip just upstream from Cliffs of the Neuse State Park in southern Wayne County. It was the first time Bruce MacIlroy and I had canoed together, and it was the first time either of us had ventured forth on this section of the river. We had consulted my North Carolina Highway Map, and it depicted the Neuse River as a gentle blue curve between the Park and Kinston. Using the distance scale we figured the trip to be about 20 miles.

Our wives came with us to the launch site. It was only about a mile by road from the Park where we had spent the night before. The launch area was at the edge of a cornfield and had frequently been used by fishermen. As a matter of fact, some fishermen were disembarking from their johnboat as we were getting ready to launch.

Did I say fishermen? Those fellows looked more like villains from the movie *Deliverance*, than fishermen. Our wives took one look at them as they pulled up to shore and that was enough. Debbie Turner and Debbie MacIlroy without ever discussing the situation, had decided it would be better if they went on back to the Park, NOW before they were left ALONE with the fishermen.

"We'll go on back to the Park and wait for you to come around the bend," they said heading for the car.

After the rather hasty departure of our spouses we walked over to where the fishermen had hauled their boat up the muddy bank.

They showed us some of the biggest catfish I had ever seen.

"Y'all goin' fishun?" they asked.

We told them we were just going for the ride. Noticing we didn't have a motor on our Folbot, they asked us how far we were going. When we said, "Down to U.S. 70 in Kinston." They could not resist looking in the boat to see if we had any camping gear. Seeing that we didn't they looked at us kind of funny and asked, "Y'all plannin ta make it in one day?"

"Yup."

They looked at each other smiling broadly and said, "Y'all have fun."

Happy to have their blessings we started out on our trial run to Cliffs of The Neuse. We had figured it would take us about 15 minutes to cover the one mile distance to the Park.

Part of the reason we thought we could leave at noon, arrive at the Park 15 minutes later, and at U.S. 70 by five in the afternoon, was due to our boat. Unlike a standard canoe, you sit on the floor of a Folbot in a seat with a back. The seat and floor boards are made of plywood, the frame is aluminum, and the hull is vinyl. This type of construction makes for a light boat with a seating arrangement more comfortable and stable than a canoe. It also means you need a different type of paddle: an eight foot long one with blades on each end. Using double-bladed paddles requires the paddlers to stroke in unison to avoid bladestrikes.

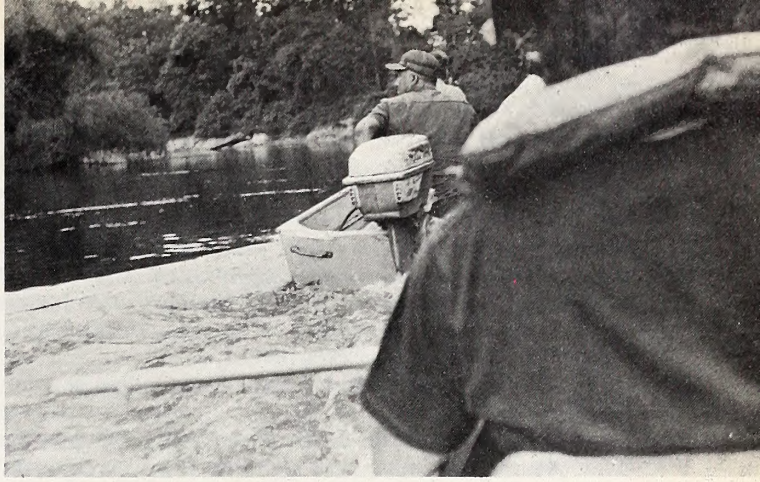
After a few "Clacks" from striking blades we got our rhythm down and began to move at a pretty good clip.

The first thing we noticed was that there were a lot of curves in the river that were not on the map. The second thing we noticed was that it was taking us longer than 15 minutes to get to the Cliffs. With every bend in the river we grew more certain that the Cliffs were around the next bend. After 45 minutes of constant paddling we pulled within sight of the Cliffs and our anxious wives; who, by now, were certain we had met our doom at the hands of the fishermen.

UNdaunted, despite our late arrival at the Cliffs, we called up to the girls to expect us at six o'clock instead of five. Then, we sat back and gazed at the 90 foot high earth wall rising in front of us. Coasting gently downstream, we could see the different layers that make up the Cliffs of the Neuse.

The fact that the Neuse flows in a straight line for about a half a mile below the Park restored our confidence in the way the river was represented on our highway map. After drifting along until we could no longer see the Cliffs, we were a little dismayed to see the river narrow and begin to curve again.

A pattern began to develop. On one side of the river would be a steep bank, and as the river curved a white sandy beach would appear on the opposite side. Usually there would be some willow trees just at the edges of the beach where the sand curved back toward the



This is the Folbot ready for the river trip (left) . . . and this is the other end of the trip (right). Help from the outboard fishermen was welcome as darkness and an unfamilar river began to create problems.

low bank. More often than not a kingfisher or two would be seen as we rounded each new bend in the river. If the kingfishers' loud calls did not alarm the rest of the wildlife, we would see turtles sunning on logs, and even an occasional family of ducks hiding in the willows that grew out in the water.

Each new bend in the river bred new expectations for wildlife. Sometimes we would be paddling along and disturb a big fish which would jump out of the water in front of our paddles startling us with its leap and size.

Other surprises were not so pleasant. Like the time we passed under the Seven Springs Bridge. We knew that we would pass the town of Seven Springs but the bridge we went under was not on the map, and neither was the road that went over it.

It was fun drifting by Seven Springs because it was the only stretch on our journey where there were houses that had their backyards bordered by the Neuse River. Looking at the old Seven Springs Health Resort with the Spanish Moss-laden shade trees draped over the aging white buildings also provided some scenic variety.

The gentle current soon took us past Seven Springs and into another series of bends. Bruce and I decided we would see how fast we could get around the next bend. We began to paddle faster and harder. Water dripped in the boat from the furious action of our churning paddles. Then, we stopped paddling to enjoy gliding with our momentum, and looking back at our wake. I was still looking back at the waves decreasing in size behind us, when I heard Bruce begin to paddle again.

Simultaneously, there was a gasp from Bruce and a splash in the river.

"My paddle just sank," Bruce moaned.

It happened so fast I barely saw it go by before it sank out of sight.

In my most reassuring voice I said, "Don't worry Bruce. "It's a plastic paddle designed to float."

We backpaddled waiting for the paddle to resurface. It didn't. We even pulled up on a sand bar waiting for the plastic paddle blade to be carried downstream. It was no use. The paddle didn't know it was designed to float.

There we were only one-third of the way to our destination and reduced to an awkward paddling arrangement. I paddled harder knowing we would have to really push ourselves to get to highway 70 on time. Bruce, frustrated by the awkwardness of his one very long paddle, stared ahead from his forward position in the Folbot. There in front of us loomed the unmistakable form of another bridge. It too was not on the map.

We paddled swiftly and silently to get away from the ominous reminder that we had been stupid to use a map that covered the whole of North Carolina when we really needed some county maps.

After approximately two miles of hard paddling, our awkward paddling arrangement was simplified: One of my paddle blades fell off and sank. I vowed then and there I would never buy any cheap department store paddles unless I planned to use them in a concrete swimming pool.

With cautious vigor we began paddling canoe style; trying to keep up a good rate without losing our two remaining paddles. At least now we could paddle on opposite sides at the same time, restoring some semblance of the rhythm we had enjoyed with two good paddles.

With our newly restored rhythm, it did not take us long to reach our third stupidity reminder; another bridge crossing the river and not on the map. When we passed that last unmarked bridge we entered what I have since named, "Lenoir County's Neuse River Maze."

It is ten miles by air from Lenoir County road #1152 where it crosses the Neuse to the US. 70 bridge in Kinston. The Neuse River between those same two points is at least 20 and very possibly 30 miles long. The reason, we found out the hard way, is the river contorts itself in every conceivable direction to include tying itself in a knot.

Going into a maze and knowing it is one thing, but going into one when you are constantly expecting a straight path is something else again. It is demoralizing.

The meanderings of the river were not the only morale dimmers on our trip. We entered the Maze in mid-afternoon. It was a very hot sunny day. Our arms which we thought were tan enough had become sunburned. Fortunately, we had known enough to wear long pants and wide brimmed hats for sun protection, but they did not stop our arms from hurting. As the afternoon wore on we began to notice the bugs. First horseflies and later deerflies. The horseflies would land on us and we'd kill them before they could bite us. The deerflies were another matter. They would do acro-

batic stunts just to torture us. Their favorite stunt was to fly between Bruce and his glasses. Somehow they seemed to know that Bruce could not hit them without smashing his glasses into his face. We were almost glad when it got too dark for the flies.

The only reason we were not glad when it started to get dark was that we had no earthly idea how much further we had to go. In fact, we began to wonder if one of those bridges had, indeed, been the U.S. 70 bridge. Neither of us had been to the 70 bridge before, so it was entirely possible we had gone right by it before our wives had gotten there.

To add to our confusion, the "Maze" lies between N.C. highway 55 on the South, and Lenoir County road 1324 and U.S. 70 to the North. With every bend in the river we would hear cars coming from a different direction. Each time we said to ourselves that the U.S. 70 bridge had to be around the next bend.

We began to worry about our wives at the bridge. What were they thinking with us so late? What should we do if it got too dark to see where we were going? Should we sleep on one of the sandy beaches and let the girls worry themselves to death, or should we plod on in the darkness and risk ripping the bottom of the boat on an unseen snag?

I don't know what Bruce was thinking but I began to pray. It was not long after that; just around the next bend, that we came across some fishermen in a small motorboat.

We had passed other fishermen earlier on our trip without saying a word, maybe a silent nod, nothing more. When we passed this boat one of them called out asking, "Y'all havin' fun?"

"Yeah," we replied with false enthusiasm.

"Where did ya put in at?" they asked.

"Goldsboro," Bruce piped back.

"Goldsboro—Why that's where we're from. Say, you fellas look a little tired. Would you like a tow to the bridge?"

"Would we like a tow?" Bruce and I chirped at the same time.

"Yes sir."

Without asking our names or asking for gas money the fishermen from Goldsboro took us in tow. As we got closer to the bridge we noticed more fishermen. Way before the bridge came in sight the fishermen we passed were shouting to us, "They're waiting for ya." Our wives had been asking everyone who went fishing from the time we should have arrived, on, to look for us. At one point we noticed a fork in the river. The fishermen towed us down the left fork, but if we had come this way on our own we probably would have taken the wrong fork in the dark.

When we finally did pull within sight of the bridge we saw two very forlorn looking women sitting on the dock. Realizing they couldn't see us behind the motorboat, we waved our paddles in the air.

Seeing the Folbot at last, the girls jumped up and down hugging each other for joy, and shouting, "It's them, it's them!"

When we reached the dock the fishermen asked us if they could help us get the Folbot out of the water. We thanked them and said that they had helped us more than we deserved already.

While we were being warmly welcomed by our wives the fishermen left quietly.

My wife said, "You sure were lucky those fishermen helped you." I nodded in agreement as I thought to myself, "Fishermen or Fishers of Men?" ▲▼

• **OLD MOSSBACK from page 17**

you must do so before dressing it, and again a .22 calibre pistol will do it quickly. Cut off the head close to the skull as the neck has plenty of delicious meat and then hang the snapper by his tail to drain for 30 minutes or so. You'll need a very sharp knife and pliers to clean the turtle because his skin is extremely tough and requires a lot of effort to remove. When you're ready to begin dressing, place the turtle on his back, stomach up, and cut completely around the circumference where the top and bottom shells join. Remove the entrails and skin and cut out all four legs and the neck. This is no small task, so allow 45 minutes for cleaning. Be absolutely sure to remove every trace of the yellowish fat and other membranes as they will impair the flavor. Rinse the meat carefully, cover with cool salted water and place in the refrigerator overnight before trying the following recipe.

Turtle Jambalaya

Meat from one medium size (10 lb) snapper, approx.
2-3 lbs. meat
1 lb. fresh or canned okra
1 8-oz. can tomato paste
5 stalks celery, diced
2 cups uncooked white rice
2 lbs. fresh or canned tomatoes
2 medium white onions, diced
1 large green pepper, diced
3 tbsp. black pepper
1 4-oz. can sliced mushrooms
1 tbsp. butter
1 tbsp. paprika
1 tbsp. red cayenne pepper
OPTIONAL:
6 oz. prepared shrimp and liquid (canned or fresh)
6 oz. oysters and liquid (canned or fresh)

Boil turtle for two hours or until meat is tender. (Again, be absolutely sure no fat or membranes are present before boiling.) Remove meat from bones and cartilage and cut into bite size pieces. Saute lightly in butter in four-quart sauce pan, then remove from heat. Add tomatoes (if fresh, slice into quarters), tomato paste, onion, okra, celery, green pepper, and all seasonings and bring to a boil while stirring constantly. Remove from heat, stir in two cups water and mushrooms and optional shrimp and oysters. Return covered to low heat and simmer for 30-45 minutes. Cook rice very dry separately. When done, ladle Jambalaya over rice and serve with oyster crackers and hot vinegar or similar condiments. You're now ready for a culinary treat you'll long remember! ▲▼

• **PHOTOGRAPHY from page 23**

used for taking pictures indoors with tungsten light (regular light bulbs, but not fluorescent lighting). Tungsten film has a reddish or warm tint; if you use it outside, without a color correction filter, your picture will have a red tint. If you are going to use the same film inside and outside, find out which filters can be bought to correct the bluish or reddish tints for these films.

For color photographs, you will also notice printed on the outside of film boxes, the names of the kind of film you are purchasing. If the suffix reads *color,* you will be taking color *prints.* If the suffix reads *chrome,* you will be using reversal film or *slides.*

There are a number of ways you can improve your color photos with the use of filters. On most 35mm cameras, the filter is simply screwed onto the front of the camera lens. You may wish to investigate the uses and prices of some of these filters for color photos —polarizing filters, haze filters, color correction filters, and warming and cooling filters. Filters are also available for black and white film. Black and white film is oversensitive to blue light. For instance, if you are taking a picture on a sunny day with white clouds in the sky, you could use a red filter to make the clouds stand out. When you are using filters with black and white film, the filter lightens the objects of its own color and darkens its complementary color.

Composition is as important to your picture taking as is knowing the correct film to use for the situation, the ASA setting, the correct shutter speed and f stop. Composition is how you, the phtographer, arrange the subject matter of your picture. Composition is used to control the viewer's eye; the viewer's eye seeks the sharpest part of the photograph. Some components of composition are listed below—you decide when and where you want to use them.

In composing your photograph, you might wish to consider a few points; (1) aim at simplicity and try to "fill up" the picture with your subject, leaving out the extraneous background which may be distracting to the picture (this is where a telephoto lens comes in handy, especially when shooting animals where there may be great distance between you and the subject); (2) look for something natural, such as tree branches or leaves, in the setting to frame the subject; (3) if more than one subject is in the photograph, have one subject dominate by having that subject larger, sharper, or looking into the camera to show the predominant subject; (4) a certain kind of lighting effect can create a mood for your picture; (5) try to have a focal point for your picture—one which draws the eye to the center of the picture or one which leads the eye across the picture, and (6) a point of view can be stated by shooting your subject from an uncommon angle.

Contrast is part of composition too. The viewer's eye will follow contrast of lines. Some lines to use in composition are: (1) a horizontal line which suggests calmness and tranquility—"the bull's eye syndrome" is to put the line in the center of the photograph, but you can lower the line to emphasize the background or raise the line to emphasize the foreground; (2) a vertical line suggests strength and solidity, but keep it out of the center of the photograph too; (3) a diagonal line suggests action, speed, or movement; (4) crossing lines will make the viewer's eye go to the point of intersection; (5) the "rule of thirds" is to divide the picture both horizontally and diagonally and place the subject on one of the four points; and (6) the S curve, or Hogarth line (such as a coastline) suggests peacefulness and is pleasing to the eye.

Now with these basic ideas in mind as a beginning, you are ready to "shoot." Now, with a minimum investment in equipment—and no license—you may "hunt" anytime, anywhere without regard to season or bag limit. Now you can thrill to the chase alone or with a friend. Now you can capture for all time the beauty of a buck drinking from a stream; you can catch his looking up at the click of your shutter. You can record his walking away free, into the forest. And you know that the buck will be back again and again. Happy hunting! ⬍⬍

• **SHORE BIRDS from page 15**

through our state during the summer months include the whimbrel, ruddy turnstone and sanderling. The whimbrel, or hudsonian curlew, feeds mostly among the dunes, visiting the beaches only early in the morning before the crowds arrive. Sanderling are not bothered by human activity and spend most of their time running and feeding behind retreating waves. Turnstones are also commonly found along populated beaches, but they prefer to feed along sea walls and rock jetties.

Certain species of shore birds remain along the North Carolina coast to nest. The willet, the most common nesting coastal shore bird in our state, can often be seen perched on a piling or dead tree in the salt marsh. Walking along the beach, it appears only as non-descript, medium-sized gray bird with a fairly large bill. However, in flight, the willet is easily recognized by its flashing black and white wing pattern. If one happens to wander into a pair's territory, both birds noisily fly up and attempt to drive off the trespasser by diving at the intruder.

The Wilson's plover makes its nest on scheduled beaches along our coast. Due to its coloration, this bird is often overlooked. Its single breast band separates it from its relative, the killdeer, which is common inland and has two black bands across its breast.

Another common shore bird is the oystercatcher. Binoculars are necessary for a good look at the bird because of its shyness. The gaudy coloration of the bill and eye give this wader an almost clownish appearance.

As a newcomer, from the Deep South, the black-necked stilt is a rare summer visitor, except at Pea Island, where it is fairly common and is presumed to nest. Before the turn of the century, the breeding range of the stilt extended north to New Jersey. It was practically wiped out along the Atlantic coast by hunting until the only place it remained in the east was Florida. Now that it is no longer hunted, its numbers appear to be recovering.

Despite the fact that shore birds are common along our coast at anytime of the year, many people never notice their presence. These birds are a joy to watch, especially during the summer when many species acquire beautiful breeding plumages. The unique feeding habits and bizarre or even comical appearance of many of these waders offer a fascinating show for those willing to watch. Every effort should be made to preserve our coastal marshes so that Carolinians may continue to enjoy this part of our state's natural history. ⬍⬍

GREEN HERON

PHOTO BY CHRIS MARSH

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Wildlife
IN NORTH CAROLINA

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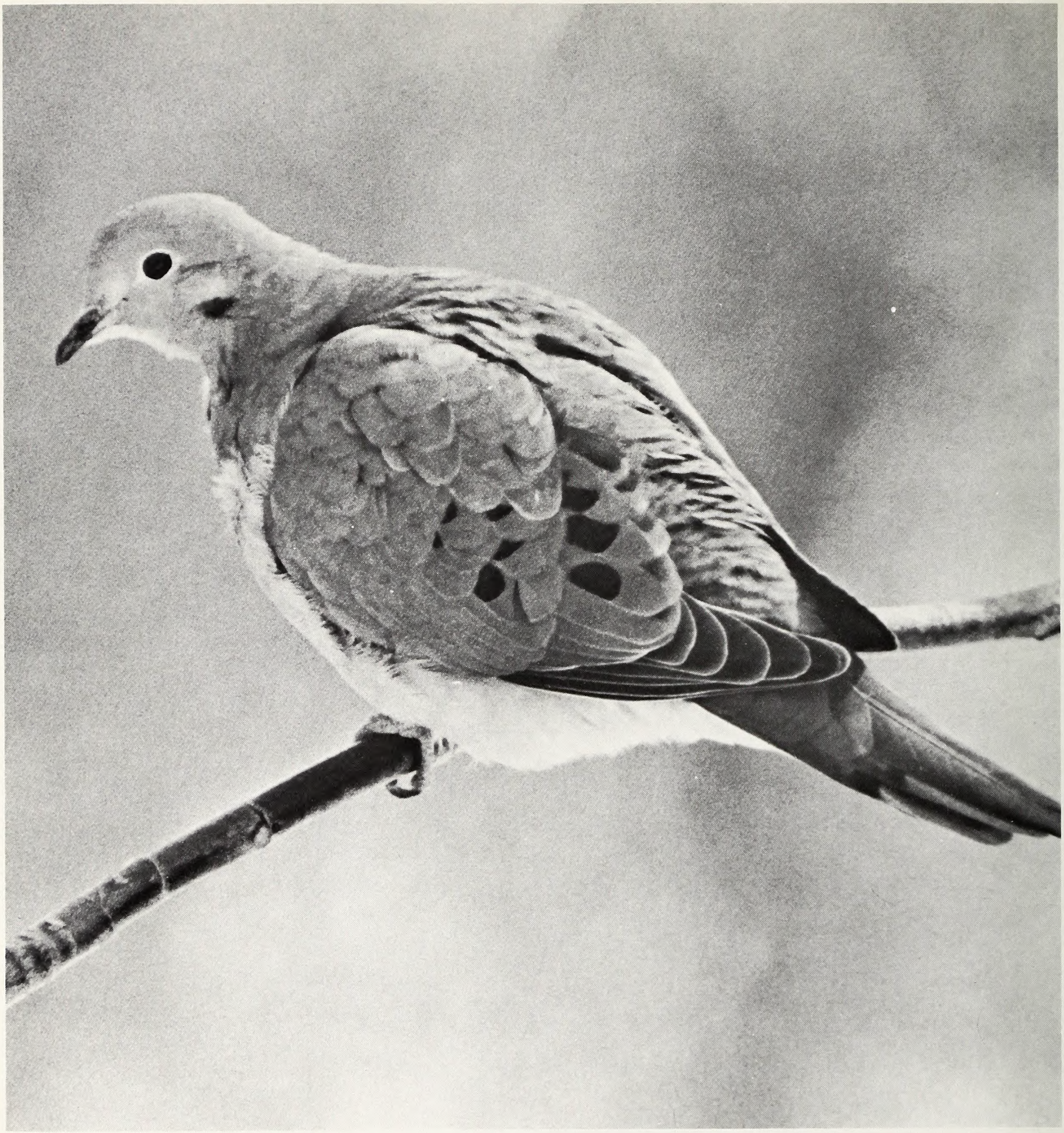

PHOTO BY LEONARD LEE RUE III

GAME BIRD

The mourning dove hunting season runs from September 4, through October 16, with the second half of the split season December 20 through January 15. Shooting hours are 12 noon to sunset. The daily bag limit is 12 doves.

National Hunting & Fishing Day
SEPTEMBER 25, 1976

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An objective of all levels of government should be to achieve and sustain a balance of the social, ecological, and economic benefits derived from natural resources. Without such balance none of the factors on the scale will be worth weighing.

The clapper rail provides some of the most exciting wing shooting of our coastal region. Success depends on high tides and favorable weather, and thus not all of the September 1 to November 9 season will see optimum conditions. Be sure that you use a stable boat for shooting, or if you wade, be extra careful of deep water and drop-offs. Painting by Chuck Ripper.

DRAWING BY RUDY POPELAS

OUR STATE MAMMAL

THE GRAY SQUIRREL

by Rod Amundson

THE gray squirrel is so characteristic of the fauna of North Carolina that a scientist named Gmelin honored it and the state with the name *Sciurus carolinensis*. To arrive at the first half of the double-barreled scientific name, taxonomists combined a Greek word *Skia* (shade) with another Greek word *Oura* (tail) which means "Shadetail" and relates to the long bushy tail which is often curled over the back so that the animal is shaded by it. The generic name *Sciurus* applies to at least 46 other species of tree squirrels in this country, but does not designate 80 different species of closely related ground squirrels or about two dozens of flying squirrel species.

Translated literally, the word *Carolinensis* means "of Carolina." So much for the scientific name of the Carolina gray squirrel. Other common names range from bannertail and silvertail in English to the name *Fanitasho* given it by the Choctaw Indians.

History

Like many other game species, the gray squirrel is described by early arrivals in North Carolina as having occurred in "myriads" and "hordes." Although no great attention to accuracy was given by pioneers in their accounts of the wildlife they found in the new land, there is no reason to believe that the gray squirrel did not at one time exist in almost unbelievable numbers. *Sciurus carolinensis* is an inhabitant of dense woodlands, and North Carolina was once an area of primeval forest.

The gray squirrel shares with the American bison the unhappy distinction of having had a rifle designed especially for its slaughter. Squirrel guns hold an important place in the history and literature of Southern states, notably Kentucky.

There is no doubt that the succulence and flavor of the flesh of the gray squirrel played an integral part in the reduction of its numbers in this and other states, but more likely the clearing of land and cutting over of dense forests played a more important role in diminishing gray squirrel populations. Despite the inroads of the woodsman's rifle and axe, the gray squirrel still holds a high place on the list of important game animals throughout the country.

Description

The gray squirrel is somewhat smaller than its close relative the fox squirrel. The latter measures about 25 inches from nose to tail tip, with 12 inches of that length devoted to tail. The gray squirrel is about 19 inches long with a nine inch tail, and weighs about 16 ounces as compared with an average of about 40 ounces for the fox squirrel.

Ernest Thompson Seton, dean of writers on American game animals, describes the gray squirrel with a few deft strokes of the pen which not only pictures the animal, but distinguishes it from the closely related fox squirrel and red squirrel:

"When seen in the tree-tops, its gray (or, in the North, its black) colour and immense, bushy tail are distinguishing marks. From the Fox-squirrel, it is easily told by its smaller size, white under-parts and the white edging of the tail; and

from the Red-squirrel, by its greater size, gray colour, and white-edged tail.

"Colour. General colour, pepper-and-salt gray, the underfur being lead colour, and each of the overhairs leaden at base, then buff, then blackish, and at the tip white; on the head, back, paws, and saddle down the back, the gray is tinged with rusty yellow. The cheeks, muzzle, ears, and upper parts of paws, are often nearly clear tan or sienna; chin, throat, under-side of legs, and all below, clear white. The long tail hairs are of the same style as those on the body, i.e., basal half, tan; next quarter, black; tip, white."

As with many other wildlife forms, there are color phases of the gray squirrel which may lead to confusion of the unpracticed observer. There is a black or melanistic phase, but this color variation rarely occurs in North Carolina. The same phenomenon occurs in the fox squirrel, but differences in size should make it easy to distinguish between melanistic mutants of the two species.

Behavior

It is possible that the gray squirrel, along with his arboreal cousin, plants more oak trees incidentally to his daily routine of seeking and hoarding food than man ever plants intentionally. Unlike other types, he does not frequently store up large supplies of acorns and other nuts in hollow trees. He prefers to bury a nut here and there in the soft earth of the forest floor. Despite a rather uncanny ability to retrieve buried nuts—even when the ground is covered with snow—it probably leaves as much as half his hidden store where it can germinate and grow.

Although nuts of various kinds are a major item of the gray squirrel's diet, it can subsist on the buds of trees during spring months when nuts are scarce, and will even gnaw into the cambium layer of trees to lick up the flow of sap. Despite classification as a strict vegetarian, the gray squirrel may at times develop an appetite for the eggs and even the flesh of birds. Such deviations from the normal are too rare to give the gray a bad name.

In general manner, the gray is a shy and peaceful citizen. It must be constantly alert for natural enemies, and is an expert at making itself "scarce" among the branches and limbs of trees. Something of an aerial acrobat, the gray squirrel will not hesitate in time of danger to make fantastic leaps from treetops to the ground. Wide-spread legs and bushy tail serve to land him without injury, and its ability as a ground-runner takes it quickly to a neighboring tree. Its protective coloring, ability to get on the "off" side of a limb, and to lie motionless along a limb for long periods of time make it a difficult target for hunters.

PHOTO BY F. S. BARKALOW, JR.

Although most gray squirrels are the normal salt-and-pepper gray color, albinos like this one, are seen occasionally. Late spring or summer litters are often born in leaf nests similar to the one shown below.

Although gray squirrels cannot be classed as migratory in the usual sense of the word, there are numerous instances of migrations ranging from local movements to mass exodus of thousands of individuals.

Gray squirrels do not hibernate, but during severe winter weather they may stay in their nests or den trees for several days at the time.

Breeding

The breeding habits of the gray squirrel in North Carolina are so closely integrated with the management (setting the seasons) of the species that the subject will be further discussed under the heading *Management*. In general, the mating season begins in the early spring and continues for a period of time varying with the northern and southern limits of the range.

Gray squirrels are polygamous. The gestation period is about 44 days duration, and the first litter may appear during January or February in this state. There are generally from two to four young per

litter, with exceptions at both extremes. Winter and early spring litters are likely to be born in hollow trees, whereas subsequent litters will be born in nests. Nests of the gray squirrel are usually placed in crotches of trees, and resemble the somewhat haphazard efforts of crows or hawks where construction is concerned. They are made of leaves, bark fibers, and other materials. An elaboration on crow and hawk nests, however, is an over-all roof which keeps the young warm and dry. Access to the nest is gained through a hole in the side.

Gray squirrels are born blind, naked, and helpless, being almost fetal in appearance. Six weeks see them out of the nest to explore their surroundings, and in eight or 10 weeks they have been weaned and can take regular food. About 10 months bring the young to maturity, but they do not reach maximum size until two years have elapsed.

Enemies

A number of birds and animals prey on the gray squirrel. Several species of hawks and owls include them in their diet. Crows make much to do over squirrels at times, but there is little evidence to show that they actually destroy them.

Weasels are the most important mammalian predator of squirrels. Minks, foxes, and wildcats take their toll.

Perhaps the greatest scourge of the gray squirrel is the botfly warble, locally called "wolves." Infestations of these repulsive larvae make the flesh of squirrels undesirable to hunters, who, when killing an infested squirrel in early fall, almost invariably throw the dead animal away as unfit for food. Botfly warble infestations must be considered in setting early fall shooting seasons.

The red squirrel, or "boomer" as it is often called (May, 1976, "Wildlife") has been considered by many as the arch-enemy of the gray squirrel. Although much smaller than the gray, the boomer is extremely pugnacious and does not hesitate to attack his large cousin. There are frequent reports that red squirrels practice a habit of deliberately castrating gray males. It is known that red squirrels do seize the scrotums of gray squirrels and tear them open. Whether this act is a deliberate effort at castration is highly doubtful.

Management

Although not as prolific as the cottontail rabbit, the gray squirrel is able to reproduce his kind to such an extent that there is little danger of a drastic shortage occurring in the forseeable future. There are, of course, population fluctuations ranging from abundance to relative scarcity. The gray's dependence on forest mast makes him susceptible to mast crop failures, and successive years of mast crop failure can cause local shortages of the species. Added to this is the phenomenon of mass migrations which can effect a complete lack of gray squirrels in certain localities.

In view of fecundity and local or regional population variations, control of the annual harvest is the most effective management practice. The same forestry practices which increase and sustain the forest owners' income serve to benefit squirrel populations. Laws and regulations have been formulated to prohibit the cutting of den trees which serve as winter homes for the species.

Clear cutting of hardwood forests destroys valuable squirrel habitat, while reforestation and hardwood forest management serve to improve it.

The intelligent setting of shooting seasons must always reckon with the breeding habits of the species concerned.

The life history of the gray squirrel has been documented to the point where seasons and bag limits can be established to the benefit of both the species and the hunters who seek it.

An excellent book entitled "The World of the Gray Squirrel" has been published by J. B. Lippincott Co. (New York and Philadelphia) and sells for $5.95 is highly recommended for detailed information on the gray squirrel. The authors are North Carolina's own Fredrick S. Barkalow and Monica Shorten.

Gray squirrels, particularly young ones, have their share of enemies, not the least of which is the powerful great horned owl. Even with predation, squirrel populations generally remain in good shape in North Carolina.

The botfly larva or warble, emerges from the flesh of the gray squirrel, leaving an open wound, and making the squirrel undesirable to the hunter. Control of this insect is all but impossible and some years have severe infestations.

Wild Turkey Restoration in Macon County

By: Members of the Franklin Wildlife Management Crew: Edward Waldroop, Jack Mason, Joffrey Brooks and Jerry Anderson and Wildlife Biologist: Brian D. Hyder

THE early morning gobble of the wild turkey can again be heard in the Cowee Mountain Range of Macon County. During the winter season of 1976 the Franklin Wildlife Management Crew completed a wild turkey restoration project by stocking this area of the Nantahala Game Lands with 15 wild turkeys.

This stocking effort is only a part of the North Carolina Wildlife Resources Commission's program to restore the wild turkey to all suitable habitat throughout the state. Increasing hunting potential is also one of the main objectives of all statewide wild turkey restoration projects.

A basic criteria has been formulated to establish priorities in regard to areas considered for stocking. Areas considered are determined by field personnel to be either devoid of turkeys or with birds at such low numbers that it would be impossible to repopulate available range. Success of the project depends largely upon publice support and cooperation of local landowners. Areas considered must have a sizeable acreage of Game Lands available for public hunting.

Habitat requirements of the wild turkey are the most important aspects in selecting areas to be stocked. The Cowee Range of Macon County has mature stands of mixed-hardwoods, conifers, open understory, scattered food plots and openings, available water supply, and sizable acreage of relatively isolated areas; all important aspects of good wild turkey habitat.

Mixed hardwoods provide primary winter food supplies for turkeys, and conifers serve as roosting sites and shelter against extreme winter weather. Food plots and openings created and maintained by the U.S. Forest Service and state wildlife management crews provide food as well as necessary brood range. Products of food plots and openings such as grasses, insects, and fruits are preferred foods for the wild turkey during the spring and summer months. Large isolated areas enable the turkey to utilize more of the available range.

Wild turkeys were trapped on National Forest Service land in Macon County. This land already has a well-established turkey population. Turkeys were trapped by means of cannon net and tranquilizing drugs. Immediately after capture the turkeys were sexed, aged, and banded. The birds were banded with numbered aluminum tags attached to the leg for identification. Six gobblers and nine hens were released—an ideal sex ratio—insuring a good propagation potential.

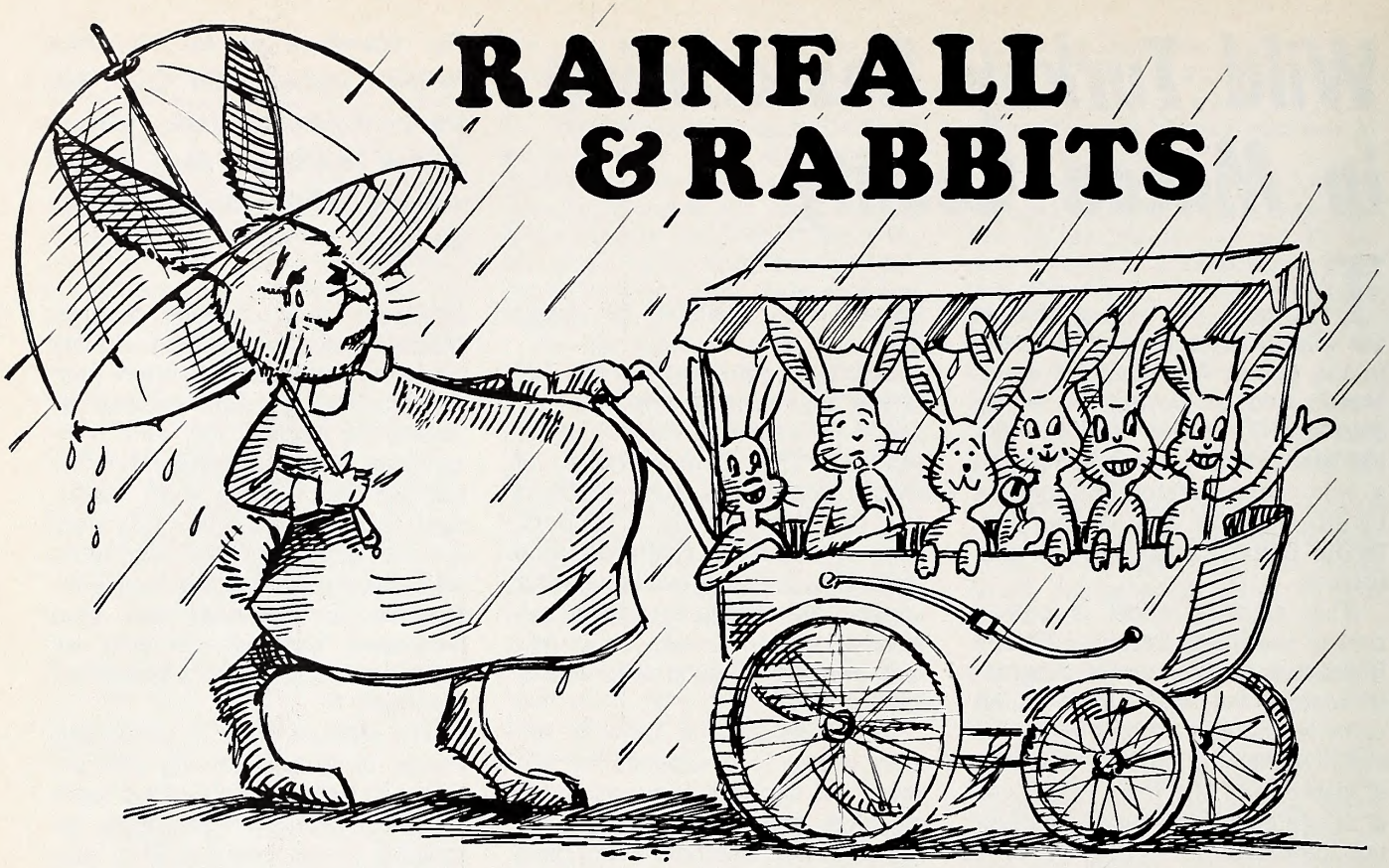
The stocked birds in the Cowee Range of Macon County are believed to be one of the oldest pure strains of eastern wild turkey remaining in the country. This successful stocking will help to insure the increase of this particular strain of wild turkey. Future wild turkey restoraiton projects across the state are already in the planning stages. The goal, to restore the wild turkey to much of its original range in North Carolina, can be achieved with continued cooperation between the Wildlife Resources Commission, the U.S. Forest Service, landowners and the general public.

PHOTO BY GARY VAN HOUGH, THE FRANKLIN PRESS

Wildlife Management Technician Ed Waldroop prepares to release a hen turkey live trapped on Macon County Forest Service land. The release site, below, shows habitat diversity requirements.

PHOTO BY FRED FOSTER, U. S. FOREST SERVICE

RAINFALL & RABBITS



by James E. Applegate
Assistant Professor of Wildlife Biology
Rutgers University

Reprinted from "New Jersey Outdoors"

"BILL, we got six rabbits out of that hedgerow last year, but we only started one today!"

"Yeah, I know. I've had a hard time starting them anywhere this year. It must have been all that rain we had last spring."

How many times have you heard that conversation or something that sounds almost like it? If you're a rabbit hunter, you've heard it more times than you may care to remember. Everyone has a notion of good years and bad years in small game hunting and the possible influence of weather, but it may suprise you to know that the exact relationships between rabbits and weather aren't all that clear, even to wildlife researchers.

In the first place, animal populations—especially bunnies—are the result of many factors; some of them understood, others not. These factors operate separately and also affect each other and, in general, make it awfully tough to predict rabbit population levels. What are some of these factors? You probably know some of them, but let's consider them before getting back to weather.

Most Important Factor

The most important factor is habitat. Every rabbit hunter can look over an old hay field—with grass growing around an abandoned hay rake, a tangle of blackberries here and there, and a few trees beginning to show through the weeds—and just know that the spot is crawling with rabbits. And most of the time he'll be right. By the same token, he'll drive right by a field that's grown up with saplings that have shaded the grass and low-growing weeds. A rabbit would have to carry a lunch box in a spot like that, and both the hunter and the rabbit know it. So, first and foremost, the type of habitat has a great deal to do with the number of rabbits we can expect on a given piece of land.

But, like Bill and his buddy, we've all been to that favorite spot that always had rabbits, and come out without needing to clean the bore of ole Long Tom. Why?

"Road kills!" you say, "I once drove along Fly Harmony Road and counted five dead rabbits in about a three-mile stretch." Road kills, and accidents in general, do take a share of the annual game crop, but they are what game biologists call a "density independent factor," which means that they take a constant proportion of the population, no matter how many or how few we have in that population. As such, that proportion doesn't change much from year to year and has very little effect on making good and bad bunny years.

Parasites and disease affect rabbit populations, as they do all wildlife. The normal rabbit, however, carries a healthy slug of parasites without showing many ill effects. Most every rabbit I've looked at has had the intermediate stage of the dog tapeworm, and most also have their share of mature tapeworms and roundworms. Parasites rarely cause death in rabbits, however, so we can't blame them for bad rabbit years. Disease, on the other hand, is less constant in rabbits, and therefore more devastating when it occurs. But we have a lot to learn about predicting disease out-

breaks in rabbits, so it's difficult to predict good and bad years based on disease considerations.

Any other factors?

"The foxes," my Dad used to say. "I saw one down the road just last week." My Uncle would agree and add, "Chicken Hawks!" for good measure. Aided by many studies, however, we've come to realize that these predators rarely keep the numbers of rabbits down. True: foxes, owls and hawks eat rabbits, but they just can't keep up with Ma Cottontail's wonderful ability to do what rabbits are famous for.

Let's take a quick side trip and refresh our memories on what it is that rabbits do best. Ma Cottontail usually roars into March pregnant, and brings forth her first litter during that month, generally four or five sons and daughters, depending on such things as age of the mama, how far north or south she lives, and (would you believe) the kind of soil she lives on.

Papa and Mama are given to some rather interesting maternity ward manners, because cottontails have what's called a post-partum estrus. In plain talk, that means that Mom's in season right after she's wheeled out of the delivery room. Mama is then impregnated for litter #2 of the season, which will arrive in just under a month. That's only a short time after she's kicked the first batch out of the house, or, more properly, allowed them to discover that Mom's no longer going to pick up the lunch tab. Litter #2 is born and Papa immediately sets the stage for litter #3; and so it goes throughout the spring and summer. Wow!

More, More, and More

Enter the eldest daughters, who by August and September, have entered puberty and are also capable of aiding Mom in her attempt to cover the world with rabbits. This they do almost as well as Mom, averaging about one less bunny per litter than she usually has.

Let's do some calculating now. From March to September Mom's had as many as seven litters. Since there are many reasons why she might not have all seven litters, let's be conservative and use the generally accepted figure of five litters per year, and estimate an average of four young in each litter. That's 20 bunnies. Now let's say that she had a total of four daughters in her March and April litters, each of whom had three little ones apiece during September. That's 12 more bunnies for a grand total of 32 new rabbits from one tired out Momma who started the season in March.

Of course, the majority of these guys never make it to the hunting season. Rex Lord, whose research on rabbits in Illinois is probably the best piece of bunny biology available to date, estimates that on the average about 70% of the young rabbits die before they're a month old. That's about 22 of our 32 offspring. Since Rex Lord's estimate of 70% represents an average figure for many years of bunny watching, the *actual* number of young rabbits dying in any particular year could be smaller or larger than 70%. So, if 90% of the young rabbits died last year and only 50% died this year, Ma Rabbit's effort would have resulted in only three new bunnies last year but 16 this year—the differences between a bad and a great season.

Now, again, what factors determine whether 50% die or 90% die? Disease, parasites, accidents, habitat, predation and—yes—WEATHER. We recently found that rainfall does indeed affect fall cottontail harvests, but not just rainfall anytime in the spring or summer. The most important times appear to be March and September. Why March and September? We think, but we're not sure, that it's tied up with the reproduction biology that's already been described. The months of March and September together account for a potential 16 bunnies born compared to 16 in all of the other months put together. So anything that affects survival of young during these months would have a much greater effect than a lot of rain in any other 2 months. As you might expect, the months of April through August are also important, but not as important as March and September.

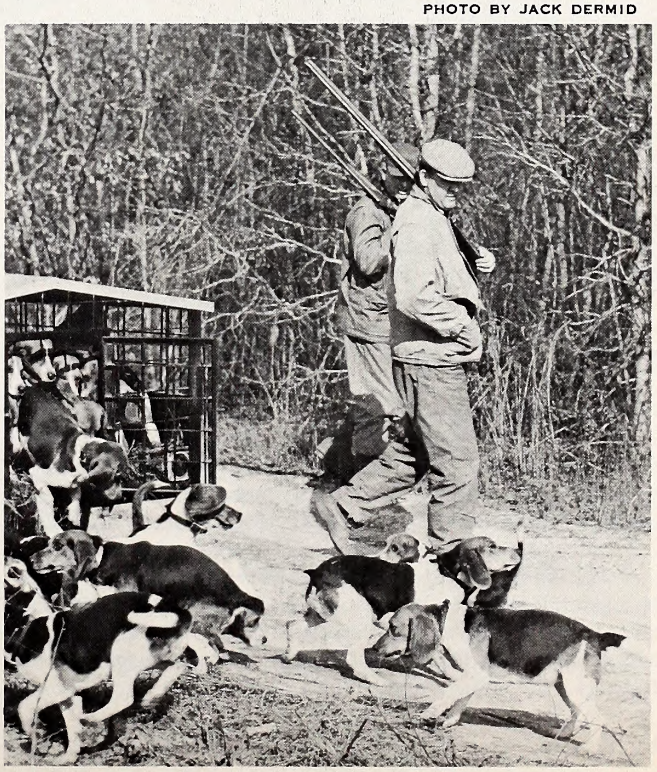
Rainfall A Factor

What we found in our study was that if rainfall in March and September is light, the bunny harvest *can* be good. I say "can" because, as we just discussed, there are other things that can limit the population. All of the very good years in our study occurred when March and September rainfall were both below average. But there were some avarage and slightly below average rabbit years during the dry times too. It is likely that some of the other factors acted in limiting the bunny population during those years. In several years, high ranifall in the April-August period offset a dry March and September. The point here is that you're on shaky ground if you predict good years when March and September are dry.

On the other hand, whenever we had a lot of rain in March and September, our study showed that rabbit harvests were usually well below average. In 1974, for instance, March and September rainfall on the 5 areas we studied added up to 12, 12, 13, 14, and 15 inches (Average is about 7½ inches). On all of these areas, the harvest was either the worst or next-to-worst on record!

Weather does affect bunny hunting. And if you want to see what Fall may bring, check your rain gauge in March and September. If it's lower than usual, that hedgerow may hold its four or five cottontails. If it's overflowing, there will probably be a lighter-than-average weight in your game pouch. ▲▼

PHOTO BY JACK DERMID



PHOTOS BY JOEL ARRINGTON, N. C. TRAVEL PROMOTION DIV.

DRUM ISLAND FISHING

by Judy Fidler

I always look forward to the coming of summer because fall is close behind and I know that fall is fishing time at the Outer Banks for my husband Bill, and myself. Bill has been going to the Outer Banks fishing for about eight years and I have been going along for about the last five.

My first trip to Drum Island was something every woman who loves the great outdoors and the thrill of fishing should experience at least once in her lifetime.

Bill and I left Indian Trail around 10 p.m. last October and drove all night in order to catch Don Morris's boat over to Drum Island. The boat leaves the dock around 7:30 a.m. If you are not there, you have to wait until around noon to get across to the Island on his second run, but I'm getting a little ahead of my story. As I said, we drove almost all night in order to be at the landing by daylight for the trip across to the Island; the whole dock comes to life as if by magic as soon as it's light. People pile out of their cars, trucks and campers to begin loading all of their supplies and fishing gear onto Don's boat.

By the time Don loads two beach buggies, enough supplies to last a week for about 30 to 50 people, and the people themselves onto his boat, there is not enough room for a mosquito to squeeze aboard. Of course, the mosquitos are there; you know the kind, the ones that sound like jets coming in for a landing. They love bug spray, it actually seems to attract them, and by the time everything is loaded and ready to go, you feel weak from the loss of blood.

As Don pulls away from the dock, we begin to gather everyone around in our party, which amounts to 10 to 12 of us, and begin to discuss who will do what when we dock to prepare things for fishing. It is still a mystery how we all usually leave home at different times, live in approximately the same area and some how still manage to all be at the dock ready to go by daylight. The decision as to who will do what is usually no big choice. One of our party, Gary Grey, is an expert mechanic, so he is usually the first off the boat as soon as Don stops, with his gas can, pliers and screw driver in hand.

North Carolina's Outer Banks are the gathering place of fish and fishermen in the fall. A nice channel bass comes ashore in this Core Banks scene. Fifty and sixty pounders are common.

After Gary jumps off, then come the beach buggies, which some of the other parties have brought along with them; then we commence with the unloading of hundreds of pounds of drinks, groceries, ice, fishing gear, gas, tires, and so on and on and on. Since you would never know what the weather would be like while you were there, you had better carry clothes for warm, cold, and wet weather. You can't even begin to impress upon a person how quickly the weather can change on the Banks, it can go from hot and dry, to 40 M.P.H. winds, temperatures in the 30's to 40's, and rain so hard that you can't see the cabin next door.

Well, by this time we are settled in the Drum-Hilton, and Gary has the buggy running and everyone is ready to go fishing. About this time I am beginning to feel like I haven't slept for 48 hours and about ready for a nice long nap when Bill yells—"LOAD UP!" Now, when Bill yells load up—he means, load up. I learned this the hard way. If you are not ready, you get left. It's every man for himself—and I do mean every *MAN*. By the time you first set foot on the Island, you are one of the boys and are treated like one, (except when it comes time to do the dishes, and then everyone suddenly remembers that you are a woman). I am usually the only woman in our party, and girls—if by now you are thinking 'Boy, she really has it made'—just remember what I said about "EVERY MAN FOR HIMSELF." By the time the week is over, you will have done everything the men have done, including pushing the buggy out of the sand when it gets stuck, and if you ever go out in a buggy, sooner or later, you will wind up stuck.

Our buggy is a 1964 Chevrolet station wagon with all the doors cut off and a wooden top built out over the back of the car with rod racks along the front bumper. A chopping board, where we cut up the bait, is built out from the back bumper. We carry everything with us that we need to last all day, such as drinks, food and all the different kinds of fishing gear you may need. We leave the cabin around 6 a.m., so you have to get up around 5 a.m. in order to eat breakfast and stand in line for the bathroom, and as I said earlier, when the call comes to load up, you had better be ready. As you leave the cabin, the sun is just coming up and it is a beautiful sight. It is not possible to describe the sunsets and sunrises on the Banks until you have seen them for yourself; they are breathtaking, and you really have to see them to believe them.

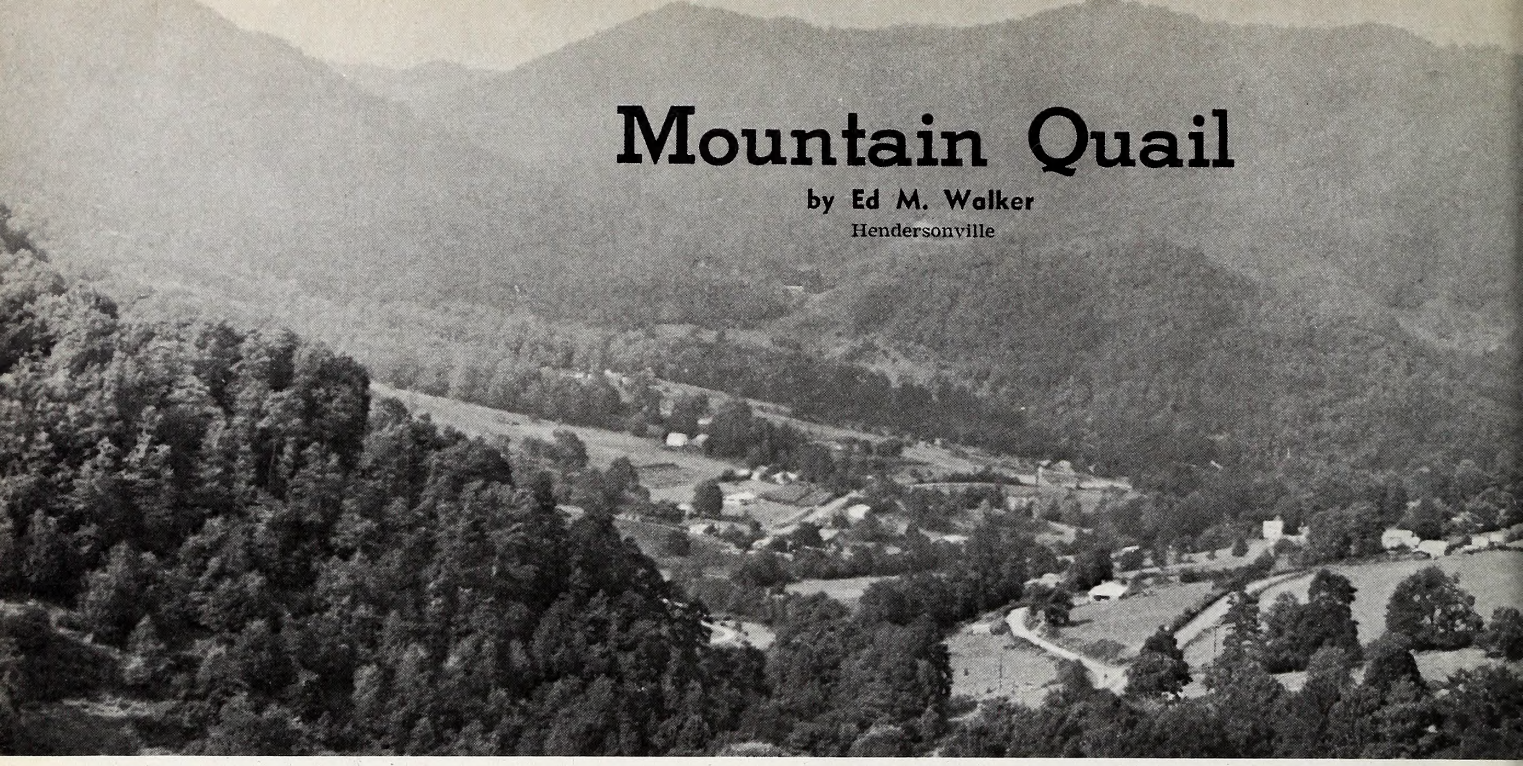
After watching the sun rise, I am fully awake and ready to fish. Bill finds a good hole and stops the buggy and we all pile out. It is usually a mad rush to see who gets a hook in the water first. As you might guess, the scramble around the chopping board for bait is unbelievable with lines getting tangled, and everyone bumping into everyone else while trying to find the right sized weight. This you can never do even though there are 10 different tackle boxes on the buggy. Gary is usually the first with his bait in the water; how, I don't know unless he secretly baits his hook while the rest of us are waiting for the bathroom. Kirby Miller is next, with Bob Warner and Bob Griffith and Jenks Caldwell hitting close for third and fourth. By this time the rest of us are chewing our nails and trying to get to the bait. I usually bring up the rear and always have to hunt a sand spike. By the time I get my bait in the water, there are usually a couple of fish in the drink box.

I don't worry about it, because I know with patience and a little luck, I'll have a fish on too. At this particular time I have a drum rig out. This is a heavy surf outfit rigged for the big channel bass or as some people call them, red drum. Just as I decide I am going to go to the beach buggy to get a drink, Bob yells out—"Judy run get your drum rig, you just got a strike!" Well, my coke went one way and down the beach I flew in the other direction, (never did find where my coke went). I was lucky, and had hooked a big drum. I was so excited I didn't know what to do; I shouldn't have been worried because with 10 men all giving advice who could lose.

That drum pulled me up and down the beach for about 30 minutes and I was so tired by this time I was shaking. No one would help me hold on to him, they all laughed and said, "He's your baby." Just as I thought he was tiring, off he would go again. I finally got him close enough to see and let me tell you the sight of a 40-pound fish on the end of my line erased all thoughts of being tired. By this time, the fish was getting tired too and it wasn't too much longer before I had him in the breakers: Bill gaffed him for me and brought him up on the beach. I can tell you I was one proud girl and by that time, a confirmed Outer Banks fisherman.

On this particular trip everyone in our party caught a big drum, plus all of the flounder, blues, spottails, trout, and even a shark or two, that they wanted to catch. Of course every trip is not this fantastic, but this was one trip we will all talk about for a long time to come, and one I will remember always.

As we packed up and got ready to head for home, the fellows are already planning next year's trip and I am just as excited as they are. We don't mind leaving the Island as much when we're making plans and looking forward to the next year. ⬍



Mountain Quail

by Ed M. Walker
Hendersonville

CONTRARY to general belief, quail hunting is thriving in the mountainous counties of North Carolina and is not confined to the piedmont and lowlands. A recent N.C. Wildlife publication states: there are probably at least 100 coveys of quail in every county in the state. This is undoubtedly true and if the hunter is willing to cultivate farm contacts, do a lot of skipping from one area to another, and is willing to walk rough land, he can easily limit out on most given days.

I'm a resident of Henderson County—not exactly the roughest part of our state, but part of an area that is shaded very lightly on maps showing the density of quail population. But I have found the quail hunting consistent and improving over the years. I'm fortunate to work in a hardware store that is frequented by the rural folk, and I spend the year asking about known coveys and securing permission to hunt so that during the season my friends and I can use every possible free hour to pursue our favorite sport.

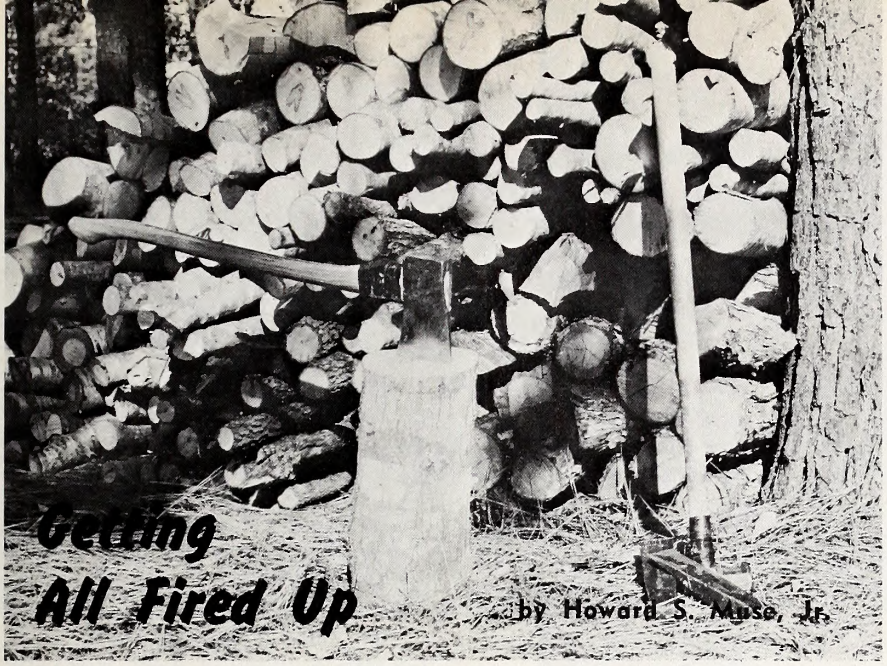
Quail hunters in our area are divided into two distinct groups: the well-to-do gentlemen variety that usually owns several fine dogs and as a general rule do their hunting on trips to the Tarheel lowlands and the local "scrambler" type like my friends. The two groups get along well as we share the common interest of bird lore. We usually own one dog of questionable pedigree and do our hunting half days off or holidays, right here at home, usually with a fair degree of success.

We start our hunting when grouse season comes in. Not for quail of course, but since the grouse season comes in before quail season, it gives us an opportunity to work the dogs, build a little stamina, and locate birds. By the time the season opens, we know where many coveys are, and have permission to hunt. A typical hunt might take us to four different areas of the county in a half day, with an hour's hunt at each spot and 20 to 30 minutes drive between each hunt. My old female bird dog enjoys the riding, and at her age (and mine) can use the rest.

We periodically check the contents of the birds' crops to find out what they are feeding on. While birds are found regularly in blown down corn and old bean patches, the overwhelming favorite seems to be ragweed seed. Hunters taking up the sport should pay particularly close attention to any good size patch of ragweed. Abandoned farm land is the best cover available when grown up with this noxious weed. Hay fever suffers like myself pay the price with headaches and stuffy heads, but I have never regretted a hunt for this reason.

It will soon be quail time and if you are a resident of the western one-third of our state, you should keep several things in mind. As stated earlier, use the off-season to make contacts and line up places for next year. Also, it's a good time to buy yourself a fine dog at a bargain. Many hunters don't relish the thought of feeding a non-productive animal for nine months until the next season and will let a good dog go cheap. Every dog I ever owned I bought right after the season closed at a good price, and I never regretted a single dollar spent for food or care. Also if you have a chance to see the dog work at the end of the season, you see the dog at his best and can get a good idea of what he is capable of doing.

Get ready now and be ready to take to the fields after birds. In the meantime, oil up those boots, polish the old Sterlingworth and don't forget to give old "Doc" or "Hannah" or whatever you call your pointer or setter a friendly pat on the head occasionally. They miss the excitement of the covey rise too. ▲▼



Getting All Fired Up

by Howard S. Muse, Jr.

SUMMER is slipping away, the lengthening shadows of autumn are edging across the land, and it's only a matter of time before the chill of winter arrives. It's time to stock up with firewood, for after several mild winters in a row, we are due for a cold one. Wood cut, split, and stacked in the fall will be ready to warm chilled bones in January and February.

Until recently cutting firewood and keeping the home fires burning were tasks that the modern generation were losing, but thanks to the energy crisis many are discovering the joys of woodburning fireplaces and stoves. And little wonder, for a cord of good hardwood (that's a pile 8 x 4 x 4 feet) contains as many BTU's of heat as 150/175 gallons of fuel oil, 24,000 cubic feet of natural gas, and almost as much as a ton of coal.

Aldo Leopold, the father of American wildlife conservation, had this observation about fireplaces: He said modern society is forgetting where our food and fiber comes from and also where we get our heat. For one to avoid this, he wrote in his classic *Sand County Almanac*, "He should lay a split of good oak on the andirons, preferably where there is no furnace, and let it warm his shins while a February blizzard tosses the trees outside."

"If one has cut, split, hauled, and piled his own good oak, and let his mind work the while, he will remember much about where the heat comes from, and with it a wealth of detail denied to those who spend the weekend in town astride a radiator."

Ratings for North Carolina Firewood

	Relative Amount of Heat	Easy to Burn	Does it have heavy Smoke?	General Rating & Remarks
Hardwood Trees				
Ash, red oak, white oak, beech, birch, hickory, hard maple, dogwood.	High	Yes	No	Excellent, easy to split
Red maple, cherry, walnut.	Medium	Yes	No	Good
Elm, sycamore, gum.	Medium	Medium	Medium	Fair when seasoned — hard to split
Basswood, cottonwood, yellow poplar.	Low	Yes	Medium	Fair — but good for kindling
Softwood Trees				
Southern yellow pine	High	Yes	Yes	Good — but smoky
Cypress	Medium	Medium	Medium	Fair
White cedar, eastern redcedar.	Medium	Yes	Medium	Good. Excellent for kindling. Throws sparks
Eastern white pine.	Low	Medium	Medium	Fair — good kindling

(From the U.S. Forest Service pamphlet, "Firewood for Your Fireplace.")

If you don't want to buy green firewood at $20 and up for a random pickup load (which should be about a third of a cord), and you have a place to cut wood, all you really need are a small crosscut saw, axe, sledge hammer, and wedges. For $100 to $250 you can buy a lightweight, non-professional chain saw. McCulloch, Homelite, and Poulan are the Chevrolet, Ford, and Plymouth of chain saws, with Stihl, a German make, the VW, finding increasing acceptance with professional woods workers because of its quality construction and reliability.

The old five-foot crosscut saw, or "misery whip," is coming back into favor. It gives the users that good old-fashioned sweat-and-smile exercise, conducive to friendly conversation and plenty of satisfaction. Some even prefer the easy rhythm of a two-man, cross-cut saw to the bulk of a chain saw, and it doesn't require fuel or maintenance or bully your eardrums either.

An informative booklet, "Firewood for Your Fireplace," by the U.S. Forest Service provides guidelines for the neophyte woodcutter. The firewood cutter, says the booklet, should select undesirable trees. "This includes trees that are poorly formed, diseased, of little use or weed species, and genetically inferior species."

"They occupy valuable growing space, which thrifty young trees might well use for continuing development. When diseased, these trees pose a hazard to nearby healthy trees. If genetically inferior, they may continue to reproduce and could keep the forest area full of poor quality trees for generations to come."

Generally speaking, ash, red oak, white oak, beech, birch, hickory, hard maple, and dogwood are the best firewood obtainable in North Carolina. Pine—whether it be longleaf, loblolly, shortleaf, or white—makes good kindling, but is not very good for lasting fires. It burns hot, intensely, and too quickly. In eastern North Carolina, your best kindling is "lightwood," the resin saturated old-growth longleaf pine stumps that still abound in these pine woods.

But whatever you cut and no matter how you cut it, take your time. Carelessness will only yield a smashed finger or worse. And while the coals warm you one winter night, you will have the satisfaction of knowing that you did it yourself.

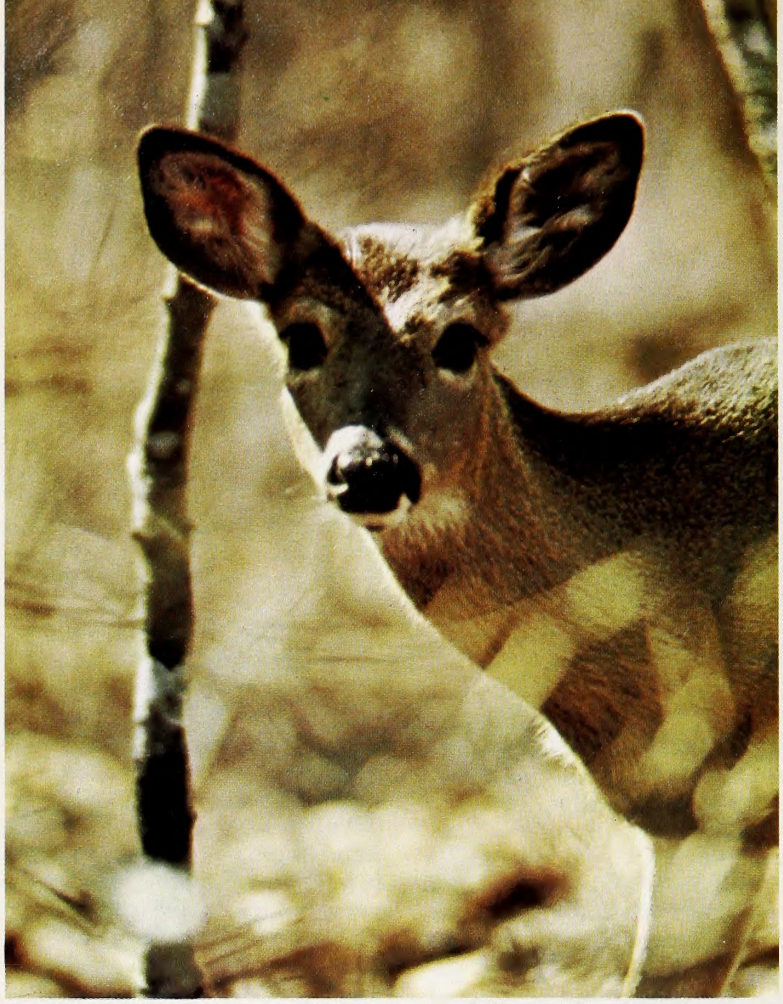


PHOTO BY DAVE BURNEY

Deer populations are growing in many sections of North Carolina, and careful watch is maintained by biologists lest the deer become too numerous.

POPULATIONS

by Chris Wille

Reprinted from OUTDOOR OKLAHOMA

IT has been popular to think of the Balance of Nature as a set of scales. Like the scales of justice, they may tip slightly in one direction or the other, but normally hang nearly dead center. All the decimating factors on one side of the scales (predation, disease, and death) are neatly balanced by the pleasant springtime scenes of nesting, birth and budding.

In reality, nature's movements are more akin to those of a roller coaster, with wildlife populations starting slowly, then soaring to dizzying heights, only to come screaming down a series of bumps to a level near the starting point.

The difference between these two analogies is an understanding of how populations of living things fluctuate and interrelate. The term for this complex phenomena is population dynamics.

A knowledge of population dynamics is essential to the design of a workable wildlife management program. Sportsmen find a basic comprehension useful in evaluating season regulations, bag limits, special hunts and in understanding the relative abundance or scarcity of a particular game species. A knowledge of population dynamics is of further importance in that the natural laws that apply to populations of deer, rabbits or bass also apply to man.

A population is the total of any given species in a described area. It has actual and projected characteristics, which the biologist attempts to define or measure. It has a geographic size, a density (the number of animals per unit/area), a certain structure defined by the sex and age composition of the animals involved, a social organization and a variety of factors that determine growth or decline. A population can be characterized as increasing, decreasing or stable.

The factors that affect population growth are divided into two categories, often placed on opposite sides of the balance scales of nature. There are natality factors (producers) and mortality factors (reducers).

The natality factors begin with the size of clutch or litter. The rare and diminishing California Condor lays only one egg every other year. Quail often incubate 15 or more eggs. Healthy does often drop two fawns, while many rodents have litters of from six to twelve. A sturgeon will lay three million eggs, and the ambitious oyster produces 100 to 500 million eggs. This great variety in clutch and litter size has interesting significance when considered with the other natality factors.

The second natality factor is the number of litters or clutches per year. Some meadow voles have ten litters per year. Most of our big game gives birth annually. Elephants produce only one offspring every 2½ years.

A third natality factor is the minimum and maximum breeding age. Most upland game breeds the first year. A vole can breed within 30 days from birth. Deer usually mate the second spring and elephants must wait until they are 13 or 14 years of age.

A fourth factor affecting productive potential is the mating habits and the sex ratio of the population. Mating in birds like quail that pair up (monogamous) requires an equal number of both sexes. Polygamous animals like deer and pheasants will have a greater productive potential for a given number, if the females outnumber the males.

A final factor is the density of the population. If the number of animals is low, individuals may have difficulty in finding a mate. This problem is most apparent in rare, wide ranging animals like wolves. Conversely, a very dense population may put such pressure

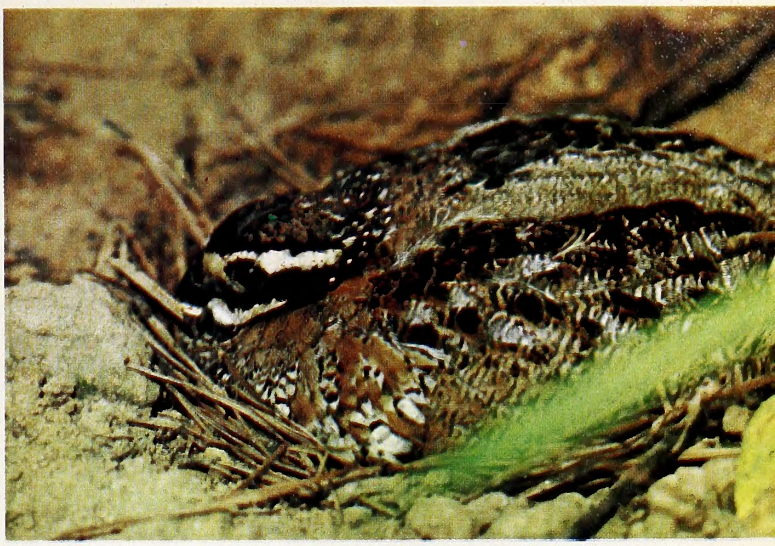


PHOTO BY J. E. NICHOLSON, JR.

Wildlife populations do have their "ups and downs," with most of these cycles attributable to the several factors discussed here. Grouse (left) seem to be very abundant for a year or two then fairly scarce for a period. The bobwhite quail (right) seems a bit more stable, but numbers also fluctuate.

on the food supply that the animals are reduced to poor health, which will inhibit production and survival. Density can have a very significant effect on production, but because these effects are so subtle and often so complex, they are difficult to measure. The importance of density will become more apparent as we continue to investigate population dynamics.

The study of population fluctuations among wildlife species is relatively new. Even with the knowledge accumulated by centuries of studying human populations (demography), it took researchers years to recognize all the factors regulating natality. It took years more to discover how they were integrated with mortality factors to produce the ever misunterstood "balance" of nature.

One fact is readily observed; nature produces far more than she can support. Almost every species reproduces as if it had the whole world to conquer, and at one time this was true. To survive the rigorous gauntlet of natural selection a species must produce far more young than are necessary to propagate the next generation.

Unbridled production is an amazing thing. In the absence of limiting factors, populations grow at an astonishing geometric rate. Everyone knows about the incredible reproductive capabilities of bacteria, flies and other small organisms. A female field mouse may only live for 18 months but can produce 150 young in that time. Even game species like pheasants have an amazing potential. In 1927, for example, about three dozen adult pheasants were released on an island in Lake Erie. Pelee Island was 10,000 acres of prime pheasant habitat. In five years there were so many pheasants that farmers were searching out the nests and breaking the eggs to protect their crops. Within seven years, the locals were shooting 10,000 birds a year. Any game species has an impressive potential. Unfortunately for hunters, there is a gridiron of mortality factors stalking each and every animal population.

Not very many wild birds or animal die of old age. The swift scythe of death often strikes before eggs are hatched or a newborn animal takes its first step. Many hunters would be horrified to learn that, if as many as half of the quail or duck eggs laid manage to hatch, it is considered a good year.

One of the most obvious mortality factors is predation. Carnivores eat the herbivores, and big carnivores eat both. Man takes a predatory toll on everything. The importance of predation on game species has long been the subject of heated debate. Western man has somehow come to view predators as evil. While we hide our own killing behind slaughterhouse doors, we condemn the mountain lion for dropping a slow doe.

Nonetheless, many a quail egg, young bass, or fawn falls prey to some predator. Species that suffer voracious predation have evolved super reproductive potential, however, and predation is seldom a serious limiting factor to population growth.

Disease and parasites are always lurking just behind the scenery, waiting to strike a weakened individual. If a sepcies is pushing the limits of its food supply, disease and parasitism become important mortality envoys. Sometimes a new disease or parasite will strike a non-resistant population and may nearly wipe it out before an immunity develops.

Now we can see how the natality factors begin to relate. In a species with a large number of litters per year, immunities can be developed quickly. For example, it took the houseflies of the world only 50 generations, or about 5 years, to develop a massive resistance to DDT. Condors, with their slow birth rate, will probably fail to develop a tolerance for DDT type pesticides in time.

Animals suffer from accidents much the same as humans. Accidents bring random mortality, regardless of the individuals' health, age or sex. Climate, of course, is a long-range regulating factor, but weather on a day-to-day basis can cause significant mortality. Unseasonable storms or drought can decimate a population.

Starvation is the final limiting factor. If the other mortality elements fail to keep a population in

check, many animals will ultimately starve. Usually disease, predation or weather will reduce the weakened animals, so actual death by starvation is not as common as it may seem.

Whereas density is a natality factor, stress is a mortality constituent. Stress is directly related to the number of animals in the area. It is a complex and integral concept that has been the subject of extensive research. Basically, stress is a built-in limiting factor that causes animals to begin dying off, or to fail in reproduction, for no other reason than there are too many of that species in the area.

Now, finally, we get to the dynamics portion of population dynamics. We have seen that most species produce in seemingly unrealistic abundance, only to have the new crop reduced to supportable levels. It would be to our advantage then, to be able to determine at what level the population could be stabilized through manipulating mortality, or even better, to increase the levels at which game populations can be maintained. Modern biologists can do both.

With the relatively new understanding of how wildlife numbers fluctuate, an estimate can be made as to where the population is headed. New knowledge of concepts like carrying capacity give us an idea of how to increase total sustainable numbers. Carrying capacity is the ability of the habitat to support any particular species. Any given piece of land or body of water can only provide the necessary ingredients of life for so many deer, quail, or black bass. Biologists know that the only way to increase wildlife populations in the long haul is to increase the land's carrying capacity. This generally means improving the quality of the habitat. Meanwhile, on a short term basis, the populations may be fluctuating in several different ways.

With an abundance of good habitat, a population will grow in a manner represented by a sloping "S" curve on a graph. This is the situation found with animals placed in new habitat. Examples would be bass stocked in a new lake, or birds placed in favorable vacant habitat or deer that have been transplanted to suitable locations without resident big game.

With a small initial stock it takes a few years for the population to get started. But then the numbers grow at a logarithmic rate as the population starts up the slope of the graph. Finally it should level out as carrying capacity is reached and various forms of environmental resistance (mortality factors) come into play.

When a population begins the long graphic climb towards a peak in numbers, it is only a matter of time before that unfortunate number is reached, the scales tip and the species starts sliding towards disaster. The goal of wildlife management is to allow a game population to build to the highest sustainable number. Once that level is reached the manager must either reduce natality or increase mortality to prevent the population from peaking out.

The easiest, cleanest and most humane way to stabilize a population is with sport hunting. Allowing any of the other mortality factors to go to work is begging disaster and assuring long-lasting detrimental affects. Hunting enables the wildlife manager to increase mortality on certain species, in predetermined areas and during specified times. It is the only controllable form of environmental resistance.

Experiments have shown that removing a specific mortality factor may do more harm than good. For example, predators could be eliminated from an area with a stable quail population. The number of quail would not increase, as those that had been taken by predators would now die from disease or starvation. Furthermore, the incidence of disease may increase as more sick birds are allowed to mingle with the healthy flock. Normally, predators would have removed the slower, diseased birds.

In a population of animals that has the capability of destroying its range, like deer, the result of trying to decrease natural mortality factors can be disastrous. A deer population on the Kaibab Plateau, in northern Arizona, has become the classic example of misdirected manipulation of game populations. President Theodore Roosevelt declared the area a National Game Preserve in 1906. The Kaibab had a fine population of mule deer (about 4,000) and also supported thousands of sheep and cattle. The livestock were removed, hunting was stopped and an intensive predator control program begun. In 25 years the total known predator kill was 781 mountain lions, 4,889 coyotes, 554 bobcats, 30 wolves and an uncertain number of eagles.

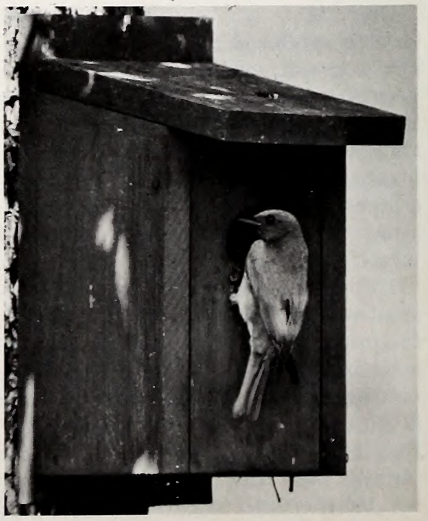
The deer herd increased by 20 percent each year. In 1918 there were 40,000 deer, and biologists were worried. The multiplying deer had begun to overburden the available forage. Still, no hunting was allowed. By 1924 the total herd numbered, perhaps, 100,000. You could count 1,700 deer in a single meadow at night. Over strenuous objections from people who couldn't comprehend the idea of "too many deer", limited hunting was allowed. Permittees shot 1,000 deer, but it was too little too late. Sixty thousand deer died of starvation that winter. Again, permits were issued (again over objections), and in 1925 another 1,000 deer were harvested. That year another 36,000 mulies starved to death.

After another decade of misery, the herd had starved down to 10,000 animals, and the forage began to regenerate. With a sound big game management program that includes hunting, the Kaibab herd has since been maintained at that 10,000 level.

Another form of growth assumed by wildlife populations is the cycle. Some species like quail have a predictable annual cycle. They start the spring breeding season with the survivors of the previous winter. These few individuals produce a tremendous surplus of animals that die off during the fall and winter. Non-game species like robins follow the same pattern, with disease and predation taking their toll. In either case the population is reduced back to the carrying capacity of the win-

Even non-hunted song birds seldom maintain a constant population from year to year, although seasonal numbers follow a pattern.

PHOTO BY LUTHER PARTIN



ter habitat.

Other animals have cyclic populations, but the cycle might be five, ten or 15 years between high and low points.

A third type of population growth is the explosive, or irruptive, mode often demonstrated by rodents. Farmers are sometimes mystified by the sudden appearance of thousands of field mice. In six months their fields may be riddled with holes and their crops ruined by mice that nearly carpet the earth. Six months later they are all gone. Dramatic changes in the weather will account for some of these population irruptions, but often they are left unexplained. Population cycles and irruptions are natural phenomena, but because of man's omnipresent influence, they are less frequent, or at least less obvious, than they might be.

In most parts of North America the standard fluctuation is the annual cycle. This provides the game manager with an interesting challenge. He can make good use of that large annual surplus by allowing hunters to harvest it. But at the same time, he should work to increase the carrying capacity of the land, which will make the base population (and the surplus) larger. In other words, he should strive towards the highest sustainable numbers of wildlife.

With even a little knowledge of how wildlife populations are regulated, it is easy to hear the ominous ticking of the human population bomb. Like it or not, we are governed by the same biological rules, although some countries like the U.S. have managed to borrow time from those rules with our technology and innate adaptabilities. Still, there are only limited amounts of resources, and the earth can only support so many people for so long. Most scientists agree that we have long since surpassed the human carrying capacity of the earth and, like deer overbrowsing, we are destroying our own habitat.

We humans are adding 200,000 people to the earth every day. That's 200,000 more people born than died. It means adding the equivalent of the entire U.S. population every three years. In the past 24 hours we added 6,000 people to the U.S., alone. That's enough people to almost fill a city like Morehead City.

It's obvious that we must either lower our natality (birthrate) or increase our mortality. The first option seems much more acceptable. Our mortality factors are the same as those working on wildlife populations: starvation (½ to 2/3 of the world population is undernourished), disease, accidents and stress (war).

At our present reproduction rate, it takes only a short time to replace in number the people killed by the most horrible of catastrophes. It takes only three days for the human population to replace in number all the Americans killed in all of our wars. We are on the longest, steepest population climb this planet has ever known.

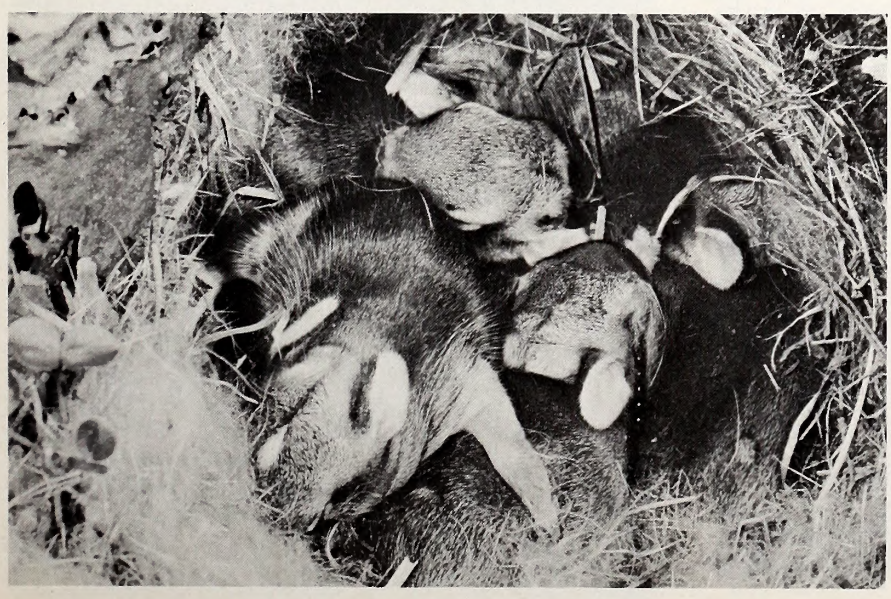
No population of any animal has ever managed to elude the eternal rules of population dynamics. All the evidence indicates that man's population is dangerously close to the peak. We all hope to prevent the disastrous crash that usually follows.

In a few short years wildlife biologists have come a long way towards understanding the factors that regulate game populations. At the same time people are beginning to realize that they must control their own population growth.

The dictums that regulate population growth are universal. Game biologists and managers are using their knowledge of these laws to promote wildlife conservation. As sportsmen we can better appreciate the intricate workings of our natural world by recognizing population principles. As members of the human race we can help define the limits of our growth by realizing that we, too, are are a naturally expanding population.

Perhaps the most difficult population to control is that of man. Resources can sustain just so many of any animal, including human beings. Where do we go from here?

Good habitat combined with good weather means an abundant population of many wild things. Rabbits, for example, have a tremendous potential for reproduction and must be held in check by various factors.

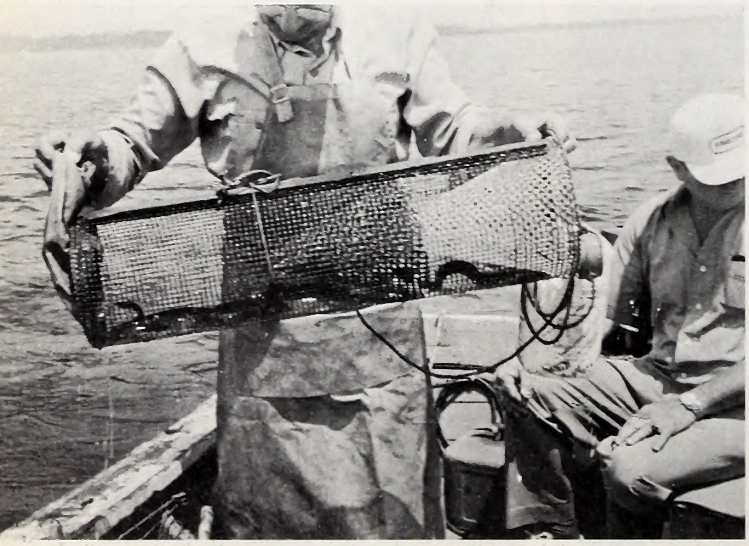


The Case of the Slippery Eel

by Johanna Seltz
Sea Grant Program
N. C. State University

Charley Bass heads across Albemarle Sound with a load of eel pots (above). The weather was good this day. The traditional round eel pot (below) is still used by some fishermen, but not Charley Bass.

PHOTOS BY THE AUTHOR



"THE intriguing thing about eeling is the amount of money you can make," Charley Bass said frankly. "Eels bring in 50 to 55 cents a pound regularly. Catfish, which we usually fish, brings in about 21 cents. That's a big jump from 21 cents to 55.

"And it's a very interesting type of fishing," he added. "The eel is a very crafty creature."

Bass, a Plymouth resident who fishes out of Mackeys on the Albemarle Sound, became one of North Carolina's 350 eel fishermen last year after reading an article in a local newspaper. He next read the UNC Sea Grant booklet, "The Case of the Slippery Eel," bought 50 traps and began to eel fish.

"I've only got a year in this and have a lot to learn. But it's worked well for me; to the point that I stayed with it. And I don't think anyone else has done much better."

Bass fishes only in the spring and the fall when the eels are most concentrated. Last spring he made about $1,000 from his two months work, working only two to four hours a day on eeling.

"It's a gravy train type of fishing now," he said. "But I'm looking to using a depth finder to locate the cool deep holes near the mouth of the Roanoke River. If the depth finder works, I should be able to eel fish year-round."

Eeel fishing is not only profitable, Bass said, it's a lot easier than net fishing.

"Right now, I'm fishing rockfish at night with gill nets," he explained. "Now the gill nets have to be a real fine mesh so when the fish hits, it won't be frightened. Naturally, when you're fishing you have people running over your nets which tears them pretty bad. And you have the nets hanging in stumps. And there's just the regular wear and tear from taking fish out and rough weather.

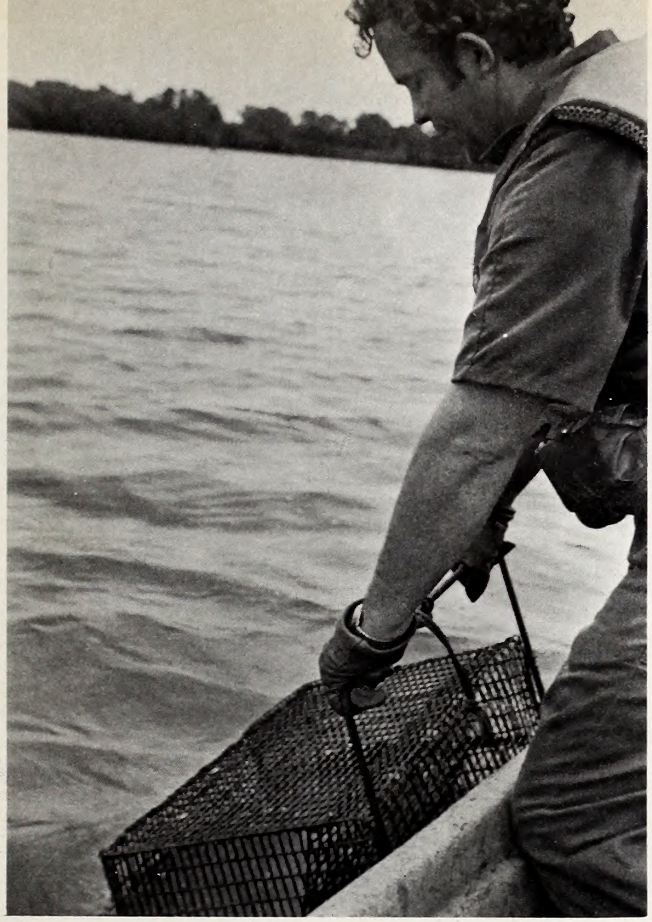
"But with eeling, the pots are made of wire, so they don't tear. And if you have rough weather, you don't have to go out because you're catching the eels alive and they don't spoil. There's very little upkeep on eel pots."

Bass uses the standard square pot but adds a crab anchor to one side. The anchors are attached with hog rings—metal clips usually seen in pigs' noses—and are made of reinforcing pipe. They provide a handle so he never pulls on the wire of the pots.

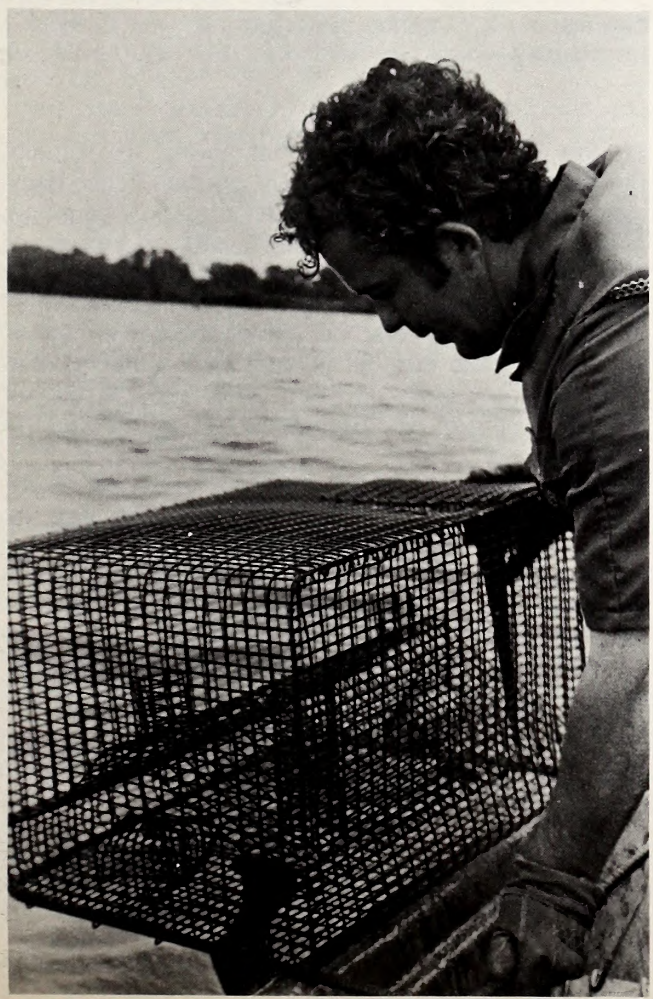
"The anchor adds a dollar to the pot—which costs about $10—but I don't like to just get by," Bass said. "This anchor has paid for itself."

In the spring Bass catches his own bait—roe herring. He also uses free shrimp heads and "fatback" (menhaden).

Although he is still a novice, Bass has his eel fishing technique down to a quick ballet of movement.



Charley grabs the eel pot by the special "handle" (above) and is ready to heave it aboard. Speed in handling is important, and it takes strength and skill to get them in and back out in a hurry.



"First you spot your buoy and head for it, on its left," he demonstrated. "Just as you get to it, you cut your motor and grab the buoy, pull up the rope, grab the handle, pull the pot on the boat, undo the door strap, dump eels into the garbage can and redo the strap. Then you pull out the rubber boot (made of auto inner tubes) in the bait well, knock out the old bait and stuff in a handful of fresh bait. You close up the well and toss the pot in so it will land flat on the bottom. All this time you're drifting so you move fast."

The engine hummed to a start and the whole process began again. By the end of two hours, Bass would have three garbage cans full of eels and water and 50 empty, baited pots.

"There's nothing complicated about it," he said. "It's just the initial expense that slows people down. And people don't know about eeling."

Bass admitted that it does get a bit "hairy" working near the railroad trestle where he sets his traps. There are only a few openings through the trestle for small boats and if a boat were caught by the wind against the wooden structure it would be like "getting caught in a meat grinder."

Once the eels are caught, Bass drives back through the cypress trees to his boathouse and grades and culls the smaller eels. The marketable sizes are slid into a long bathtub-like tank where they are kept in constantly running and aerated creek water until the dealer arrives.

The process from the eel's point of view is slightly different. The eel, a fresh and salt water fish born in the Sargasso Sea, circles the bait until it finds one of the two downward tilting tunnels into the pot. Once inside the pot, the eel panics and "like a house fly" moves up to find a way out.

There are two chimneys in the bottom section of the trap leading to an upper chamber. Eventually, the eel will find his way there, where he is stuck.

While North Carolina fishermen used to sell their eels salted as crab bait for pennies a pound, the eels that Charley Bass and other state fishermen catch land at the dinner tables of Europe and Japan where they are considered a delicacy.

Europeans were paying $6 a pound for the long fish in 1975 and the Japanese retail price has doubled in the past five years. And, according to a French consulting firm, the rate of eel demand is estimated to grow seven percent a year.

The demand, and its resulting high prices, explains the increasing attention eeling is getting in North Carolina and around the U.S., according to Sea Grant advisory agent Skipper Crow. Crow, who has worked for Sea Grant since 1972 introducing fishermen to eeling and finding eel markets, believes that eeling is still in the growing stage in the state.

"And the growth of the industry since 1972 has been tremendous," he said. North Carolina's eel fishery, which was practically non-existent five years ago, provided about 15 percent of the U.S. eel export in 1975, Crow said. And the state's eel fishermen pocketed more than $600,000 that year. That figure translated into money spent on boats, fuel and the like, gave the coastal economy a $6 million boost, he added.

"As long as the eels are there—and we don't know how many there are (so Sea Grant is planning a census)—the industry is going to grow," Crow repeated.

And Charley Bass intends to grow with it.

Hawks—Raiders of the Sky

by Lucinda Delaney
Special Agent, U. S. Fish and Wildlife Service

HAWKS have long symbolized strength and courage in nature. But unforunately, they often have been sought out and killed for a variety of reasons. This indiscriminate killing, combined with habitat destruction and misuse of insecticides, has brought the hawk population to an all-time low in the last few years.

Now, with total protection, increased public awareness, and the efforts of conservationists, many hawks are coming back. On almost any day in North Carolina, you can see a hawk of some sort, soaring through the sky in noble splendor, scanning the ground below for something to eat.

They are powerful birds, equipped with super-sharp eyesight, large, strong feet, each toe tipped with a needle-sharp talon. Their flying ability and aerial agility are unsurpassed in the world of the birds of prey.

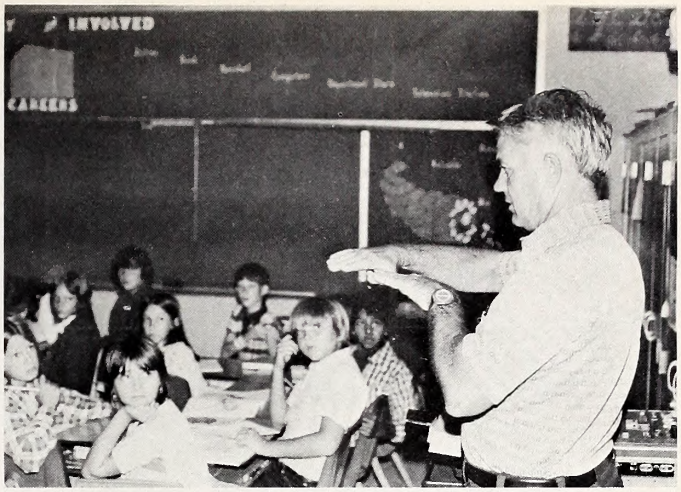
To nature's balance scheme, hawks are extremely valuable. Although they are more than a match for most any healthy prey animal, hawks usually seek out and capture the weakened or diseased birds and rodents. This "culling" process serves as a type of quality control for the natural world.

All hawks were long thought to be chicken thieves, game bird killers, and robbers of the first order. Studies have demonstrated that hawks are actually the farmer's friend and seldom do significant damage to poultry. Even the Cooper's hawk, commonly known as the "chicken hawk," eats quantities of mice, rats and other rodents, and insects (some 20 percent of its diet). And with some of the larger hawks such as the red-tailed hawk, the percentage of small rodents is over 50 percent of the diet. Hawks will take game birds now and then, but the rodents they help control would compete far more with the birds for food.

But in spite of the service hawks render to nature and man, these birds continue to be harassed by forces of our modern world. Some of the birds of prey have been placed on the rare and endangered list, and all of them, along with all owls, are now fully protected by state and Federal law. These laws prohibit the killing, possession and sale of all hawks, owls and eagles. Under Federal law, violations involving convictions under the Migratory Bird Treaty Act, call for a maximum fine of $500 and/or six months in jail. Conviction for killing a bird of prey currently on the Endangered Species list, such as the southern bald eagle or peregrine falcon, could result in a $10,000. fine, and imprisonment for six months, or both. ⬍⬎

Stem to Stern

BY ED JENKINS



Lawrence Musselwhite of the Division of Motorboats and Water Safety explains the nautical Rules of the Road to a class of Wilmington students. Such instructions make better boaters.

Although a considerable number of boating accidents result from disregard of boating safety laws and collisions with unseen hazards, lack of knowledge concerning boats and their proper operation is responsible for the great majority of boating accidents and deaths on the water. Boat education programs are the best way for individuals to learn how to safely operate their boats. They are also an important part of the Wildlife Resources Commission's overall program to make North Carolina waters safer for recreational use.

Three years ago the Wildlife Commission made a commitment to promote safer boat operation in this State through school education programs. Prior to this decision, the Commission's boating education program had been directed at the adult boat operator. Boating safety films and booklets made available to adult groups were the standard bearers of the education program. While these methods of encouraging safer boat operation did contribute to this purpose, the number of new boat operators taking to the water far exceeded those who had received any boating education.

The main obstacle to the success of most boat education courses is the reluctance of persons who know how to operate a boat to spend any time to take a boating course or do any studying or reading on the subject that would help them become a more skillful and more knowledgeable boat operator. When a person begins boating, his attitude toward this new sport and the manner in which he operates his boat form as his confidence increases. Once this attitude develops, very little can be done to change operator habits. If an individual has not received proper boat instruction, some of those habits formed more than likely will be potentially dangerous ones. As these bad habits are repeated and subsequently integrated into a person's standard way of operating his boat, the likelihood of him being involved in a boat tragedy increases. This is the finding that signaled a change of direction in the Commission's boating education program.

While several states were trying to reach adults with their boating education classes, which had the undesirable effect of competing directly with the excellent boating courses offered by the U. S. Coast Guard Auxiliary and the U. S. Power Squadrons, North Carolina pioneered the way with a programmed text design boating education course for young people. The idea, of course, was to reach these young people before dangerous habits and attitudes were formed. To be effective, the Wildlife Commission's staff knew the course would have to meet two basic requirements: (1) It had to be interesting as well as informative; and (2) It had to reach a large number of individuals.

As for the former requirement, student and teacher interest in the program has been extremely good. Below are some specific comments that have been received concerning the course.

1. "All our students really enjoyed it and brought a lot of enthusiasm into the classroom."
2. "I've been needing this for a long time. I've been driving my Dad's boat for a long time and never knew anything about this. Sure wish everybody could take this course."
3. "We sure need this. There are a lot of lakes around and you can see a lot of boats parked in yards that are a long way from the water."
4. "I didn't know that . . . . This is fun."

The requirement to reach a large number of people was also felt to be met, as 97,000 students completed the boating education course during the past two years.

The Commission's Division of Motorboats and Water Safety is planning to reach 65,000 students during the 1976-77 school year. This will be an increase of 15,000 over the number of students who took the boating course last year. The limiting factor to the number of students who receive the course is the cost to the Wildlife Commission for the course books and materials. There is no charge to the school systems or to the students taking the course.

The funds available for the Commission's boating education course come from a federal assistance grant. The amount of federal funds received is based on a formula which depends, in part, upon the number of boats registered in a state. The more boating activity there is in a state, the larger that state's share of the federal funds. To be eligible for the federal assistance, a state must fund at least two-thirds of the cost of its boating safety program.

While most of the course materials for the 1976-77 school year are already committed to schools that have participated in the program in the past, there is a supply of course materials available for new schools wishing to offer the boating education course to their students. This material will be made available to requesting schools on a "first-come, first-serve basis." Those school systems interested in participating in the course or receiving more information concerning the course should write to the Division of Motorboats and Water Safety, N. C. Wildlife Resources Commission, 325 N. Salisbury Street, Raleigh, North Carolina 27611.

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

Hunting Regulations

Copies of the 1976-77 Hunting and Trapping Regulations Digest are available from all hunting and fishing license dealers. Since the regulations for migratory birds are selected after the regular regulations are established and printed, the following seasons do not appear in the current regulations digest: DOVES: September 4 to October 16, and December 20 to January 15. RAILS AND GALLINULES: September 1 to November 9; WOODCOCK: November 20 to January 22; WILSON'S SNIPE: October 2 to January 15. Dates for seasons on all waterfowl will be chosen later after the Federal framework is made available.

Inland Fishing Regulations Hearings Set

Public hearings for proposed changes in the inland fishing regulations will be held as follows:

September 27, 1976	Asheville	Buncombe County Courthouse
September 29, 1976	Salisbury	Rowan County Courthouse
September 30, 1976	Greenville	Pitt County Courthouse

All meetings will begin at 7:30 p.m.

Boating Safety Course

The U. S. Coast Guard Auxiliary, Raleigh Flotilla 91, will begin a public Boating Safety and Seamanship Course on Tuesday, September 21, at 7:30 p.m. at the Naval Reserve Center, 2725 Western Blvd., Raleigh, N. C. Interested persons are urged to register at this first meeting. Classes will be held each Tuesday, 7:30-9:30 p.m., for the following six weeks.

For additional information please call C. F. Crutchfield, 876-3158 (Res.) or 832-3711 (Bus.).

National Hunting and Fishing Day

Many sportsmen's organizations over the State will observe this day, September 25, with displays, exhibits and various programs. The Wake County Wildlife Club will sponsor a display at Raleigh's Cameron Village. Assisting with this project will be the Wake County Bass Masters, N. C. Wildlife Federation, Joe Balickie, Gun Maker, Frontiersmen Black Powder Club, N. C. Wildlife Commission, Safari International and Wake County Wildlife Club Ladies' Auxiliary.

Either-sex Deer Season Change

At its July meeting, the North Carolina Wildlife Commission adopted a change in the either-sex deer hunting seasons this fall following a public hearing in Swanquarter. The either-sex deer season will be November 29 - December 11 in Hyde County, except on the Pungo National Wildlife Refuge. The change added a week to the either-sex season.

Hundred-Leggers, Thousand-Leggers

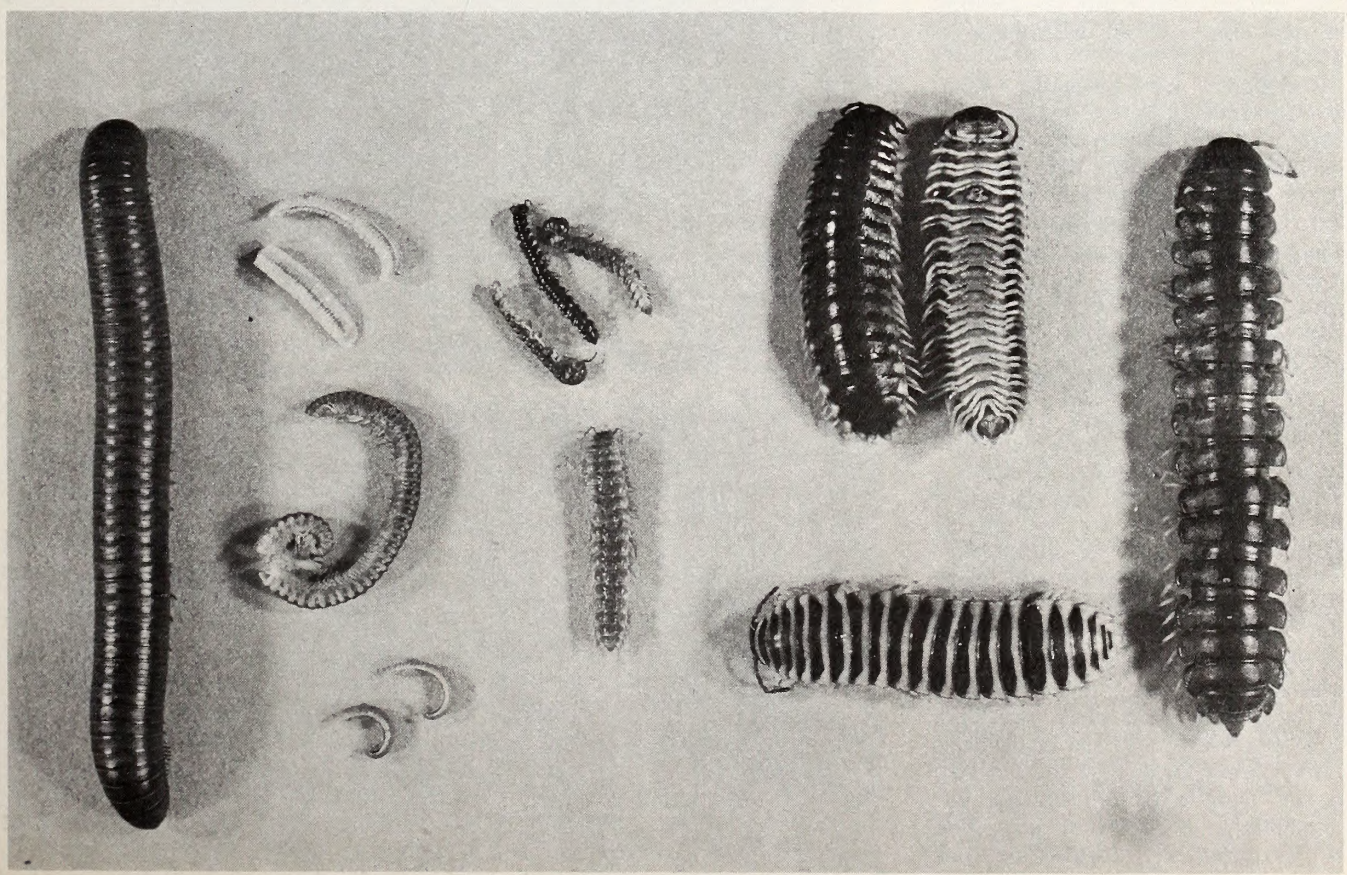
by Rowland M. Shelley
Curator of Invertebrates
North Carolina State Museum

AMONG the curiosities of nature are the multi-legged invertebrates called myriapods. Four different kinds exist today—diplopods or millipeds, chilopods or centipedes, and two lesser groups, pauropods and symphylids. Myriapods all belong to the large group of animals called arthropods, which also include insects, spiders, ticks, crabs, lobsters, and isopods. Pauropods and symphylids are small soil-inhabiting organisms about which very little is known; centipedes and millipeds, however, are larger and more conspicuous and are referred to colloquially as "hundred-leggers" and "thousand-leggers," respectively.

Although similar in having many legs, centipedes and millipeds are vastly different animals. To begin with, the names are misnomers, as most centipedes have less than 100 legs, and all millipeds have fewer than 1,000. Of the four main orders of chilopods, only the wormlike geophilomorphs are truly "centipedes," as the big number varies from 62 (31 pairs) to 354 (177 pairs). The other chilopods have either 46 (23 pairs), 42 (21 pairs), or 30 legs (15 pairs). Millipeds vary from a low of 24 legs in *Polyxenus*, a litter inhabitant of predominantly pine forests, to a high of 750 legs in a Caribbean species. The legs are also arranged differently in the two myriapods. Centipedes have only one pair of legs per segment, except the first! whereas in most millipeds, the first and last few segments are legless, segments two-four have only one pair of legs, and the remaining segments have two pairs except in males, as will be explained later.

The myriapods also differ in general body form. The four types of centipedes are flattened and have a pair of poison claws (appendages of the first segment) under the head and reproductive segments at the posterior end of the body. The body plan of diplopods, however, has been adapted to over a dozen different forms, which may be flatten-

Most of us aren't expert enough to tell one millipede (diplopod) from another. These representative types are all found in North Carolina.



ed, arched, or rounded or cylindrical. Poison claws are absent from millipeds, and the reproductive tracts open on the anterior portion of the body. For protection, some millipeds can curl-up into loose spirals and a few species can roll-up into complete balls like pill bugs or isopods. A small "pill milliped" inhabits the southern Appalachian mountains, and in southeast Asia, a few species surpass a golf ball when rolled-up. No centipede can assume these positions, although the longer species can flex their bodies into wavy lines.

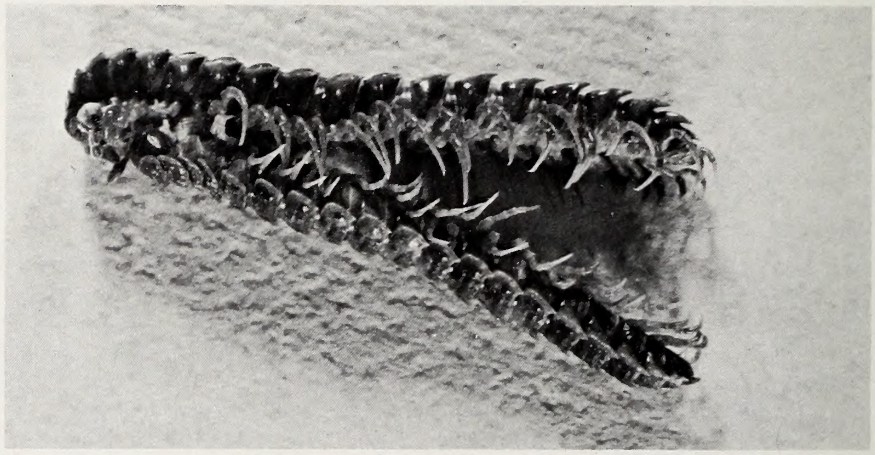
Millipeds and centipedes are both susceptible to desiccation and must therefore inhabit relatively moist habitats, such as in damp leaves and soil and under rocks and logs. Some centipedes, however, have become adapted to arid environments, and in North Carolina, *Scolopendra viridis,* a large green species, is common in the sandhills region. Diplopods cannot endure exposure to seawater, but some centipedes occur under stones and seaweed in the intertidal zone. The ability of certain millipeds to spiral and roll-up into balls protects against water loss as well as providing a means of defense. When the environment becomes unfavorabe, millipeds must seek another, and a few mass migrations have been reported. Chilopods, on the other hand, are solitary animals and do not aggregate in masses.

Diplopods are basically slow-moving invertebrates whose body form and leg motion are adapted for burrowing in soil. The animals either penetrate head-on or push with the dorsal surface of the back. The power for this pushing is generated by a very slow leg gait with the backstroke's being much longer than the forward stroke. Geophilomorph centipedes are also burrowers but accomplish this in the same manner as earthworms, by widening and telescoping their segments rather than by leg power. The other chilopods are adapted for speed, and the backstroke of the leg gait is much shorter than for diplopods.

With differences in body form and mobility, one might expect the myriapods to have different food preferences. Most diplopods are too slow to catch prey and therefore eat primarily dead plant material. Only rarely do they feed on healthy living plants, and a few species, two in the eastern United States, will occasionally eat small insects. The swifter chilopods, however, are primarily carnivorous and feed on small invertebrates and occasionally small mammals which they kill with their poison claws. The myriapods themselves are preyed upon by spiders and smaller vertebrates, and cannibalism has been noted among some chilopods. Southeastern crowned snakes, *Tantilla coronata,* are known to feed on centipedes, and in the Great Smoky Mountains National Park, millipeds comprise the bulk of the diet of the smoky and shorttail shrews, *Sorex fumeus* and *Blarina brevicauda.* The sharp poison claws of centipedes are enough to discourage most predators, however, and millipeds possess repugnatorial glands which make them generally undesirable.

The reproductive patterns of the two groups are complex and differ both in terms of the actual mechanism of fertilization and in subsequent care for the developing embryos. Centipedes have a more highly developed behavioral pattern that includes courtship before fertilization and brooding of the eggs and young. Courtship consists of a mutual caressing of the posterior end of the mate by the antennae and is followed by deposition of a spermatophore by the male. The female retrieves the spermatophore, and fertilization occurs in her reproductive tract. Eggs are laid singly or in clusters and brooded and protected by the mother. The young chilopod hatchlings resemble miniature adults and remain with the female for several days.

For *Polyxenus,* sperm transfer is similar to that of centipedes, but there is actual sexual contact, though little preliminary courtship, for other diplopods. The reproductive tracts open on the third segment, but the actual copulatory organs of males are highly modified and specialized legs called gonopods, located on the seventh segment. These structures are important in species determinations, and few females can be completely identified; due to their presence, males have fewer normal legs than females. Before copulation, the male must bend his body so that the seventh segment touches the third, and a spermatophore is deposited on the gonopods. He then seizes the female, grasps her with his legs, and transfers the spermatophore to



This is a mating pair of Pseudopolydesmus serratus **(above). The representative centipede** (chilopod) **shown below are also all from North Carolina.**

her reproductive tract. The seventh segment of the male must come in contact with the third of the female, and consequently most millipeds do not mate head to head; the head of the male will protrude beyond that of the female. The process is a little different for "pill-millipeds," as the male transfers the spermatophore with his mouth while holding the female with his hind legs, which are greatly enlarged for this purpose. Milliped eggs are protected in capsules or "cocoons" and are not brooded by the mother.

Though abundant throughout the temperate and tropical zones of the world, millipeds and centipedes are poorly known due to inattention by professional zoologists. Consequently, the state-of-the-art in diplopodology is roughly comparable to that of entomology (study of insects) in the early 1800's. This situation is particularly unfortunate for North Carolina, as the southern Appalachian Mountains, located primarily in this state, are one of the prime global centers of diplopod evolution and the probable source area of species now living in Mexico and the Pacific Coast of North America. In four years of collecting in North Carolina, I have discovered over a dozen species new to science, and in all probability this is only the beginning. Every excursion into the mountains and western Piedmont offers a better than even chance of finding something new. In the "Triangle" (Raleigh-Durham-Chapel Hill) region, at least 35 species occur, six of which have been introduced into this country from Europe or Asia. Some of the native millipeds are spectacularly colorful and combine red, orange, and yellow spots or stripes on a glossy black background. The largest diplopod in the state is *Narceus americanus,* a cylindrical form that may attain a length of six inches. It occurs statewide and is common in the Coastal Plain as well as the mountains.

The most abundant diplopod in North Carolina is *Oxidus gracilis,* the "hothouse or greenhouse milliped." It is all too well known to many people due to its tendency to seek refuge in cool, dark places, such as basements of homes. Introduced into temperate zones from southeast Asia, *O. gracilis* has proliferated in the absence of its natural enemies, and I have seen gardens and driveways literally carpeted with dead carcasses of this species. A primary control measure should be a general tidying-up of house and yard, to remove sources of shelter, and certain chemicals can be tried if this measure fails to give relief. Another household myriapod is the long-legged centipede, *Scutigera coleoptrata.* This species is frequently found in bathtubs and basins where moisture is present.

The chilopod fauna of North Carolina is less diverse than the milliped fauna and is dominated by the larger scolopendromorphs, with 21 or 23 pairs of legs. The reddish-orange species of *Scolopocryptops* are common in litter of predominantly hardwood forests, and the blue-gray *Hemiscolopendra punctiventris* is frequently encountered under bark of decaying pine logs. These species occur statewide, but the largest centipede in the state, *Scolopendra viridis,* occurs from the southeastern Coastal Plain to the sandhills, a range similar to that of the coral snake. This species grows to lengths of 3½-4 inches and is related to the giant centipedes of the tropics and southwestern United States.

Millipeds are innocuous animals and incapable of biting or stinging. One tropical species, however, can eject a fluid from its repugnatorial glands which causes blackening on contact with human skin. The affected area later peels leaving a slowly healing wound. Many diplopods emit an odor when handled, and in some cases, it is rather pleasant. In North Carolina, only *Narceus americanus* has an even mildly undesirable effect. This species produces a yellowish liquid which turns the skin purple, and it sometimes takes a week or two for the color to fade away. No peeling of the skin is involved, however, and there is neither pain nor a wound.

In contrast to millipeds, all centipedes are poisonous and capable of biting. Only the larger species can pierce the skin of man, however, and none of these are really dangerous. Only one authentic case exists of a fatality from a bite—of a seven year old child in the Philippines. In North Carolina, the scolopendromorphs listed earlier are all capable of inflicting a painful bite roughly comparable to a wasp sting. I was once bitten on the thumb by a *Scolopocryptops* and experienced pain and swelling for about an hour. These species should therefore be handled with gloves or forceps; the smaller centipedes, however, can be collected by hand, if you are quick enough.

- Letters
- Comments
- This & That

BACK OF THE BOOK

Two Booklets Every Hunter Needs

What species of American wildlife have been returned to healthy and abundant numbers as a result of wildlife management programs? Where has most of the money come from to carry out these multi-million-dollar programs? How have these efforts benefited both game and non-game species alike? What do America's major conservation organizations have to say about hunting?

If you're a hunter, the answers to these questions can be as valuable to you as knowing where your rifle shoots at 200 yards or how to talk turkey to a reluctant tom. For whatever type of hunting you enjoy, you're bound to come face to face with someone, a neighbor, a fellow worker, or even your son or daughter, who will take you to task in defending your sport. And without the facts on wildlife management and the hunter's role in conservation, you'll most likely come out on the short end of the debate.

To provide you with all the facts you need, the National Shooting Sports Foundation has prepared two informative booklets, "The Hunter and Conservation," and "What They Say About Hunting."

Beginning with a brief history of the conservation movement in America, "The Hunter and Conservation" traces the development of game laws and the science of wildlife management in this country and takes a close look at the role of today's state wildlife agencies. In addition, the booklet pinpoints exactly how hunters contribute to conservation through license fees, excise taxes and duck stamps and through the efforts of organized sportsmen's groups. The booklet also goes into the history

of wildlife in America and illustrates specific examples of species that have been restored to healthy numbers through wildlife management programs.

Published without editorial comment, "What They Say About Hunting" contains statements on the subject of hunting as expressed by 19 major United States associations concerned with hunting. Included in this listing are the policy statements of such groups as The National Wildlife Federation, The National Rifle Association, The World Wildlife Fund, The Izaak Walton League and The National Audubon Society.

One More Cast

It was an early spring Sunday morning and I was fishing in a private pond near my home in Farmville. As I usually do when fishing on Sunday morning, I was listening to the local church services on my portable radio. I had started out that morning about eight o'clock to fish for a few hours before going to the store to catch up the weekly paperwork. Two hours hard fishing had been slow without a single strike on the small popper bug I was gurgling around the edges of the pond. In fact, I was just before winding up and going in to the landing when I tossed the bug just one more time.

I turned around to reach for the on/off switch on my trolling motor when I caught a movement out of the corner of my eye. I quickly turned around again just in time to see the biggest bass I've ever set eyes on, swirl around the small yellow popping bug and inhale it just as you might do with a gnat on a hot summer night. That monster turned as my fly rod tip went into a deep bend and the drag started to buzz. He headed for a group of logs partially submerged to my left about 50 feet away. I knew in that brief second that I would have only a small chance out in deep water and no chance at all if he got to those logs. I quickly reached back and turned on the electric trolling motor and aimed the boat for the center of the pond.

Now only a true "dyed in the wool" fly fisherman can know the feeling that swept through me at that moment. Here I was with a record bass on the other end of a flimsy, fly rod with only an eight-pound test leader and a No. 8 yellow popping bug to try and land him. I don't rig up like some other fishermen do; I use only one-half of a spool of fly line on my reel and with no backing of monofilament to rely on. (After all, who needs a lot of line for a bream to pull off?)

The fish felt the resistance of the rod tip and swerved to the left toward open water and for a brief instant I got my hopes up. But then disaster . . . or at least it almost was but I managed to switch off the motor in time. But now another problem cropped up . . . the boat without the motor was being towed around and around like a cork on a cane pole and I could not control him. Because of that old theory of "action-reaction," every time I lifted the pole to pull him, he pulled me instead!! The small, seven-foot plywood boat just was not heavy enough to hold him. I reached back and once again cut on the motor and headed the boat toward open water hoping that the fish would follow, knowing all the time that if he did not want too, I sure as heck could not make him. Luck was with me, he wanted to go also.

You know, I've read a lot of stories where you are suppose to break out in a cold sweat and suddenly develop a grip of steel on the rod; well, it doesn't work that way. Other little items, such as "only a big bait gets a big fish" or "you can't fly fish in the wintertime"; went down the drain too. I've seen and caught plenty of fish in the wintertime on popping bugs and will put my fly rod up against any type of honest (hook and line) fishing at any season of the year you can name.

I had to cut the trolling motor on again to be able to control the rod tip and hopefully the fish as well. As the boat headed out to the middle of the pond, I tried to get the net up so I would have it ready. As usual, the net was on the wrong side of the boat and I had to try and reach across the tackle box and around my knees with my left hand and pick up the net from the bottom of the boat. (Why didn't I use common sense and simply swap hands with the rod? You tell me.) I won't even tell you what happened to my nice neat tackle box or the half full bottle of soda I had setting in the shade of the tackle box to keep cool.

As I waited for the fish to turn around and head in the right direction so I could net him, I began to notice some things around me. A few hundred feet away was another fisherman in a boat just setting there and staring at me, while on the bank were two college students yelling "That guy's got a big fish hooked!" But the one thing that my mind focused in on was the radio and a preacher praying for all those people who could not make it to church that morning. He was asking the Lord to bless them because he just knew they were doing something that needed his help.

Right about then, I decided to join in and as I did, that fish turned around pretty as can be and swam right into the net. Frantical-

" THEY'RE BITING LIKE MAD TODAY. "

ly, I laid my rod down in the boat and reached out and grabbed the webbing of the net, to have both hands on him, and lifted the whole works over the side into the bottom of the boat . . . I had a big fish!! It's as big as the ones you see in the magazines like experts catch every day and write about.

Friends, I was so tensed up right then that if someone had sneaked up behind me and said, "Boo," I would probably have jumped up so fast that I would have stomped the bottom slam out of the boat!!

My trophy largemouth bass weighed 9-pounds and 12-ounces, measured 26 inches long and is now at the best taxidermy shop in eastern North Carolina, Pelletier's Taxidermy Shop, over near Statonburg. I was told that it would cost $2 per inch to mount and $5 for the back board to put him on. They also make a brass name tag with the vital statistics on it for $3 more, making a total cost of $60 to get him on the wall.

Now friend, that ain't chicken feed for anyone much less a store clerk like me but I was finally talked into having it done by friends. After all they said, how many like that do you catch in a lifetime?

This fishing trip has taught me a couple of things that I'm not likely to forget any time soon. One is . . . never under-estimate the fly rod and the popping bug. And second . . . the most important thing is never under-estimate the power of prayer no matter where you are. I know.

John T. Harrelson, Jr.

State of North Carolina

EXECUTIVE DEPARTMENT

GOVERNOR JAMES E. HOLSHOUSER, JR.

WHEREAS, hunting and fishing are the favorite recreational pursuits of more than half-a-million North Carolina citizens; and

WHEREAS, hunters and fishermen were the first conservationists and environmentalists, recognizing long before the general populace that the growing encroachment of modern civilization could have adverse effects on both wildlife and human habitat; and

WHEREAS, hunters and fishermen were therefore the only group of concerned citizens to urge license fees upon themselves and insist that federal excise taxes be placed on the equipment they purchase in order to provide funds to finance the conservation of our wildlife resources; and

WHEREAS, the combined efforts of research, management and protection paid for by hunters and fishermen have restored many wildlife species threatened with extinction to relative abundance and have generally increased the rich heritage of wildlife in the State of North Carolina; and

WHEREAS, it is the obligation of those living to pass our wildlife and other natural resources on to future generations;

THEREFORE, I proclaim Saturday, September 25, 1976

HUNTING AND FISHING DAY IN NORTH CAROLINA

and commend this observance to our citizens.

By the Governor:

James E. Holshouser, Jr.

Raleigh, North Carolina
July 30, 1976

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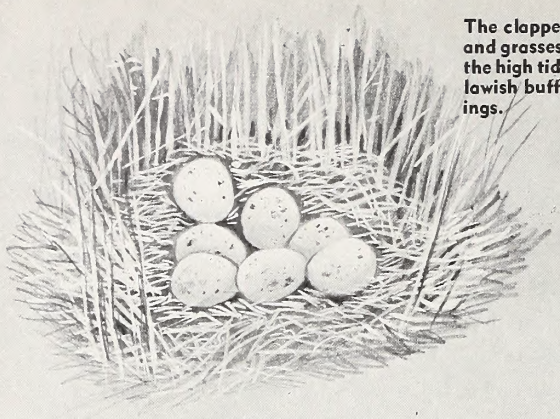


The clapper roil builds a nest af dry sedges and grasses, 7 ta 10 inches in diameter above the high tide level. There are from 6 ta 14 yellawish buff eggs, speckled with dark markings.

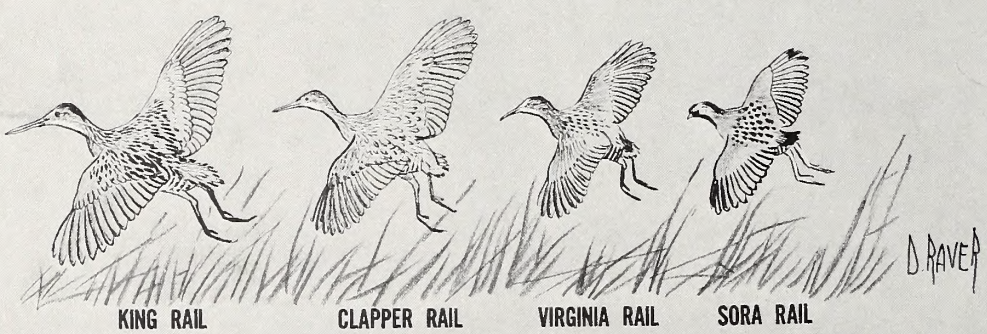
High tides in the marshes are almast essentiol for gaad marsh hen hunting. Listed are high tides for Southpart. Pivers Island and Shallatte Inlet are appraximately the same. Add one hour ta correct for Daylight Saving Time.

Tide Tables far Rail Hunters

Sept.	Doy	Time	High Tide (ft.)
6	Mon.	6:35 p.m.	5.0
21	Tues.	5:42 p.m.	5.0
22	Wed.	6:33 p.m.	5.2
23	Thurs.	7:05 a.m.	5.3
23	Thurs.	7:24 p.m.	5.3
24	Fri.	7:54 a.m.	5.6
24	Fri.	8:12 p.m.	5.3
25	Sot.	8:46 a.m.	5.7
27	Man.	10:34 a.m.	5.6
28	Tues.	11:32 a.m.	5.3
29	Wed.	12:33 p.m.	5.1

The king rail (right) is our largest rail and inhabits the freshwoter marshes. It is rarely seen in the salt marshes except an migratian ar in winter. The slightly smaller clapper rail (front cover) prefers solt woter but the habitat af the large rails overlaps in mony oreas along aur caast.

MARSH HENS



KING RAIL CLAPPER RAIL VIRGINIA RAIL SORA RAIL

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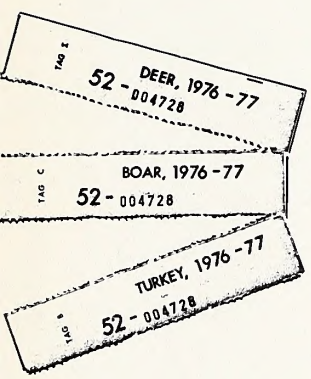
ATTENTION HUNTERS

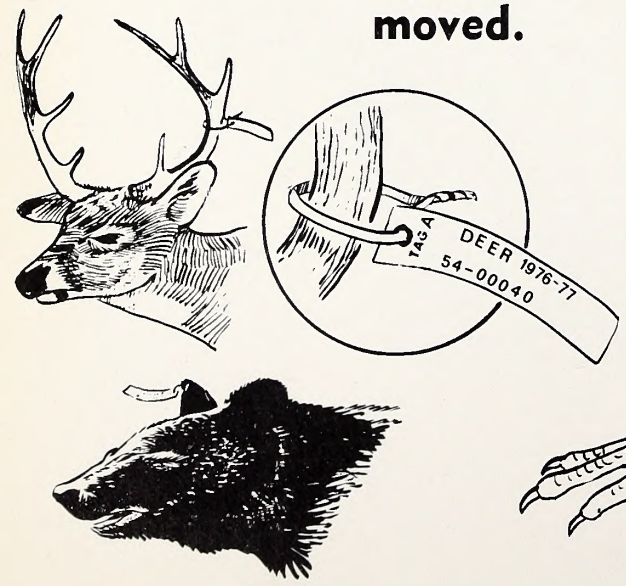
BIG GAME TAGGING PROCEDURE 1976-77

- **You must tag all DEER, BEAR, WILD BOAR and TURKEY, and file a report with the N. C. Wildlife Resources Commission through Wildlife Cooperator Agents.**

Upon making a kill, remove the appropriate tag from your license and . . . .



. . . . attach it to the carcass before kill is moved.



NORTH CAROLINA
WILDLIFE RESOURCES COMMISSION

BIG GAME KILL RECORD CARD
1976 - 1977

Attach Big Game Tag Above

BIG GAME KILLED (circle one)

1. DEER 2. BEAR 3. BOAR 4. TURKEY

SEX OF KILL (circle one)	LOCATION OF KILL (circle one)
1. MALE 2. FEMALE	1. GAME LANDS
WEAPON USED (circle one)	2. OTHER LANDS
	COUNTY OF KILL
1. SHOTGUN 2. RIFLE	
3. MUZZLE-LOADER 4. BOW	DATE OF KILL

WILDLIFE COOPERATOR AGENT NUMBER

Completed records will be collected by a Wildlife Enforcement Officer.

Remove the tag from your kill and attach to adhesive area on Report Card. Fill in the requested information and keep the carbon copy as your possession permit.

Carry kill to nearest Wildlife Cooperator Agent. He will provide you with a Big Game Kill Report Card . . . .

STATE OF NORTH CAROLINA

JAMES E. HOLSHOUSER, JR.
GOVERNOR

DEPARTMENT OF
NATURAL AND ECONOMIC RESOURCES
GEORGE W. LITTLE
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VOL. XL. NO. 10 OCTOBER, 1976

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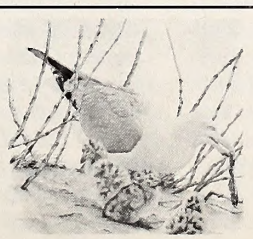
An objective of all levels of government should be to achieve and sustain a balance of the social, ecological, and economic benefits derived from natural resources. Without such balance none of the factors on the scale will be worth weighing.



Charlotte artist, Judy Mizell, won the Best of Show award at the 1975 N. C. Wildlife Art Exhibit with this painting of an adult herring gull and its young. All artists interested in entering this year's Exhibit should check page 16 of this issue. More on the December show will be presented in the November issue.

The Future of Sport Hunting

by Dr. Carroll L. Mann III
President, N. C. Wildlife Federation

This is an address delivered by Dr. Mann to the 41st North American Wildlife and Natural Resources Conference, March 21, 1976, Washington, D. C.

WHEN discussing the great American tradition of sport hunting, sooner or later one asks about the future of this sport. In spite of the fact that the sport hunters of this country have made significant contributions that have been responsible for the biologically sound wildlife programs practiced in each state, the outlook for the continuation of quality hunting is indeed bleak. Perhaps grim is an even better word. With the number of hunters increasing each year and the millions of dollars they represent pouring into wildlife management programs, how can that be? The problem as I see it appears two fold.

Obviously given good sound game management, wildlife can only prosper proportionate to the amount of habitat available. This is where we find our first major problem. Available habitat is continuously decreasing because of demands of an increasing population.

Ray Arnett, the former California Game Commissioner and the president of the National Wildlife Federation, recently came up with some rather startling figures. Each year, in the name of progress, we are washing four billion tons of sediment into our streams; destroying 1.7 million acres of wildlife habitat by surface mining; leaving 25 million tons of logging debris in our forests; stringing 300,000 miles of overhead transmission lines across four million miles of right-of-way; clearcutting one million acres of forest land; and cluttering our lands and waters with waste of four billion tons of raw material we Americans consume. It is reasonable to presume that the next generation will consume natural resources at an even greater rate.

In the next 25 years, another 3.5 million acres will be paved for highways and airports. To give you an idea of what is coming, all that has been presently built in the history of our nation may have to be duplicated before the turn of the century. Dr. John L. Schmidt of Colorado State University states that by the year 2,000, Americans will have urbanized some 19.7 million acres. This is equal to the combined area of the states of New Hampshire, Vermont, Massachusetts, and Rhode Island. With continued expansion, we are literally crowding wildlife from the face of this earth.

The Wildlife Management Institute recently published the results of a 35-year survey which clearly demonstrates just how much wildlife has suffered from the loss of habitat. In one area under study in Southeastern Illinois, grassy cover was reduced from 47.1 percent of the area in 1939 to only one percent in 1974. During the past 50 years, at least 25 percent of the shallow coastal water marsh along our major waterfowl wintering grounds on the Atlantic and Gulf coasts have been destroyed. Current nationwide loss of coastal wetlands is between one-half and one percent annually.

All these figures are impressive and though I cannot vouch for their absolute accuracy, the general trend is very alarming. Perhaps the most alarming of all is the statement by the National Wildlife Federation that wildlife habitat is being destroyed at the rate of 3,500 acres a day to provide more room for us humans. With the inevitability of expansion in America, sound wild-

life management programs are needed more than ever.

Ronald Reagan, in a speech before the Safari Club International in Las Vegas, last year made the statement that people too are "ecology." And as such we must begin managing how they react with their environment. This brings us to our second major problem.

Unfortunately, our diminishing wildlife habitat, disastrous as it may seem, is further magnified by the indirect threat to our management programs by the new antihunting movement that appears to be the present "In" fad in this country.

Under the present system, loss of the hunter's dollar would be the ruination of these programs.

The antihunters have been able to play successfully on the emotions of the uninformed and seem to have a potential avalanche of support ready to jump on their bandwagon. They expound such phrases as "hunting is no longer needed in our modern society," hunting and hunters are relics of the past and no longer fit into a modern world," and "hunting for meat is no longer necessary," and on and on and on. The hunting fraternity has legitimately countered this move with a continuous factual resume' that may be read in almost any issue of sporting magazines on the newsstand today. The facts and figures are there and the contribution of sport hunters is irrefutable, yet we appear to still be losing the battle.

I believe it is time we quit patting each other on the back and marveling at our past accomplishments and realize that the world we live in is controlled more by emotion than truth. It is because of the reluctance of Americans to make their own rational and independent judgments on any issue in question and their seeming willingness to join an emotion-based campaign in the name of progress that wildlife management and sport hunting are threatened today. Will Rogers once said that we are the only fleas who weigh over a hundred pounds. We don't know what we want but we are ready to bite someone to get it. This describes admirably the irresponsible emotionalism of the antihunters today.

With the number of hunters in this nation steadily increasing as shown by the sales of hunting licenses from 14 million in 1954 to 16 million in 1974, is this antihunting threat really real or is it being blown out of proportion? When the number of hunters in this country are examined in a somewhat different light, the results indeed are of grave concern. In 1954, the total population of this country was 161,884,000 while the number of hunters who bought hunting license totaled 14,191,552 or about nine percent. Twenty years later, in 1974, the population was 211,389,000 while 16,397,369 hunting licenses were sold for a decline in percentage to less than 8 percent.

PHOTO BY JACK DERMID

The preservation of sport hunting as we know it will take concerted effort and considerable money to accomplish. It is a task for all sportsmen.

Of even greater alarm are the figures presented by William W. Shaw in his doctorial dissertation in which he found that the American population increased 5 percent between 1965 and 1970 but the number of young hunters declined 6.7 percent for ages 12-17 and a whopping 16 percent for ages 18-24. With the decreasing amount of available habitat, young Americans seem to be changing their recreational patterns.

Though the numbers of hunters are declining on a relative basis with general population increases, Federal aid allocations derived from the 11 percent excise tax on sporting equipment this year came to 78.8 million dollars. In 1974 hunting license sales alone brought an additional 143 million. Revenue for Ducks Unlimited, a private organization financed by contributions of sportsmen, increased from $139,000 in 1940 to 8.1 million dollars in 1975. They have been experiencing a greater than 20 percent increase in donations from sportsmen yearly. I bring this up only to point out what a disaster it would be to lose these funds should the antihunting movement succeed.

Of course, it is true that a hunter's money is spent in his own self-interest; in other words, towards more game available for the bag. But there is no denying that his efforts in the past at such things as restoration of the wild turkey, which was extinct, and the tremendous build-up in the concentrations of other game species have been highly successful. An often overlooked fact is that many nongame species benefit greatly from the game management programs across our land. The antihunters have offered no substitute to fund any of these management programs.

Our goals, like our problems, appear two fold. Our immediate goal has to be the formation of a strong legislative front to fight the antihunting movement. To help accomplish this, organizations like the Safari Club International, the National Wildlife Federation, and the National Rifle Association have tried to unite the hunters across

the nation. We have to grow in numbers to have a more effective legislative body.

Dr. Orlan Westbrook, the President of the Safari Club International Conservation Fund, stated that legislative efforts can buy time but will not save the day.

Our long range goal then must be, if we are to "save the day," the creation of a new image for ourselves and a better conservation education for our children.

To help accomplish this, let us learn from the successes already made by the antihunting movement and use some of their same tactics. We should reserve our facts and figures, impressive as they may be, for those few who are willing to listen and understand and start appealing to the emotions of the masses. We need more of the likes of Paul Ott, the entertainer for the National Wildlife Federation who is able to get across his conservation message so well with guitar and song.

Safari Club International Conservation Fund is looking toward the future by introducing outdoor sportsmanship and conservation practices into many schools, and would like to enlarge this program to include every school.

There is nothing really strange about the goals of either the sport hunter or the antihunter conservationist. Both are working towards benefiting wildlife. It is strange, however, that we cannot enjoy a better rapport. Certainly, the members of the hunting fraternity would welcome with open arms any help towards scientific wildlife management and the betterment of any game or nongame species in this country.

There have already been a number of instances where shooters and nonshooters cooperated in important wildlife conservation projects. Certainly, the plight of the Florida Key deer which became critical in the early fifties comes immediately to mind. The Boone and Crockett Club, an organization of trophy big game hunters, donated salary and expense money to hire a patrolman. No ulterior motive existed because the club members had no hope or intentions of ever hunting these rare animals. When the money ran out, the National Wildlife Federation assumed the expense. This national group includes both hunters and nonhunters.

It is time the antihunters adopted the policy of Thomas L. Kimball, Executive Vice-President of the National Wildlife Federation, that hunting is a personal thing and should be left up to each individual. If the antihunters are sincere about helping wildlife in America today and would recognize hunting as a beneficial conservation tool, we would welcome them with open arms and together we could go about solving our more serious problems of descreasing habitat.

As Professor Sarkis Atamian from Alaska put it, if the hunter falls in his march towards preserving that which is worth preserving, then all mankind has failed.

I believe with all my heart that sport hunting is worth preserving, and I feel we should do everything in our power to protect and defend the integrity and continuation of this sport.

The problems of insuring the continuation of sport hunting are formidable, and innovative techniques of factual information dissemination must be developed.

North Carolina Teenagers Improve The Environment

by Howard S. Muse, Jr.

TAKE 28 teenagers of both sexes, mix them in a hardworking outdoor situation, throw in a dose of environmental education, add a pinch of recreation for seasoning, stir together and cook for eight weeks and you get Youth Conservation Corps 1976 at the Uwharrie National Forest.

The Uwharrie National Forest Youth Conservation Corps (YCC) camp is one of 22 YCC camps enrolling 564 youngsters, age 15 to 18, that was in operation this summer in North Carolina from Highlands to Cape Hatteras, from Cherokee to Croatan. All camps were coeducational.

The U. S. Forest Service operated nine camps for 265 youths, while the Department of Interior had six camps for 138 participants, including one operated by the Bureau of Indian Affairs, two by the U.S. Fish and Wildlife Service, and three by the National Park Service. Seven more camps with 161 enrollees were run by the N. C. Department of Natural and Economic Resources and by several cities and one county. Altogether, this summer's North Carolina YCC camps cost $740,000 to operate, with $655,000 coming from the Federal government.

The youngsters were paid $2.20 an hour for 30 hours of work a week. Ten hours a week were devoted to environmental education. By early July, the Uwharrie group had taken field trips to the Sandhills Wildlife Management Area at Hoffman and the Weymouth Woods Sandhills Nature Preserve in Southern Pines. One day they went swimming at the Carolina Forest on the Yadkin River for a change of pace. There was never a dull moment, for the youngsters found two copperheads, as well as a miscellany of small critters. "It's all tied in. They're learning something all the time," explained Rufus M. Owen of Troy, the camp director and a Uwharrie National Forest timber management technican.

On Monday, July 12, for example, a crew of 14 youngsters (nine boys and five girls) under Owen's supervision seeded millet on two, one-acre wild turkey food patches on a Uwharrie National Forest tract east of Pekin in Montgomery County. The actual clearing of the land was done by a N. C. Wildlife Resources crew stationed in Troy. "They help a lot. They did real well. We clear the land and they help plant it," explained Steve Juhan of Mt. Gilead, a wildlife technican with the N. C. Wildlife Resources Commission, which cooperates extensively with the U.S. Forest Service in managing the forest's wildlife resources. Last summer, YCC crews did population studies on wild turkeys.

"These kids have been getting quite a lot of work done," concluded Robert Carey, the Uwharrie's District Ranger. By mid-July, they had maintained two miles of nature trail, replaced five foot bridges, removed litter on 21 miles of Forest Service roads, and remarked and maintained 25 miles of the Uwharrie Trail.

PHOTO BY THE AUTHOR

What did the T-shirt and jean clad youngsters think of their work? Without exception, they were enthusiastic about it. Not even the 93 degree heat had wilted their youthful spirits.

"This is very educational," stated Kathy Mendenhall, 18, of Troy, a senior at West Montgomery High School. "I like it real good," added Kenny Marston, 15, of Pekin, a sophomore at West Montgomery High School. "You learn a lot about wildlife. It gives you something to do in the summer and keeps you off of the streets and you do something good for the forests," explained Tony Williams, 15, of Mt. Gilead, a sophomore at West Montgomery High School. "Some is lazy and some is smart. Some work is easy, and some work is hard," rhymed Robert Dumas, 15, of Mt. Gilead, a junior at West Montgomery High School and the crew's self-styled poet. "On the average they are a good working bunch," stated Owens.

"They're just happy as can be. You can tell it in five minutes. Most of them want to work like fury. They do a tremendous job," exclaimed Gene DeBord of the U.S. Forest Service, who, with Marshall Gingery of the National Park Service visited the crew at work during an inspection trip of YCC projects in the North Carolina Piedmont.

"How many young ladies do you have?" DeBord asked of one of the boys. "Not enough," replied Hugh Morton, 16, of Biscoe, a junior at East Montgomery High School. "You would be surprised at the work the girls do. They sure put the work out," DeBord added.

So popular was this three-year old program, in fact, that more than 3,212 youngsters from 91 of North Carolina's 100 counties filed applications. With only a fifth that many opening available, the N. C. Department of Natural and Economic Resources selected the campers in a lottery. It looks like another big year ahead, and applicants should contact the Youth Conservation Corps Program, N. C. Dept. of Natural & Economic Resources, P.O. Box 27687, Raleigh, N. C. 27611 for further information. ◆

ILLEGAL
THREATENS
OF THE WILD

PHOTO BY DOUG KNIGHT

A shotgun blast shatters the silence of the crisp, fall air and a plump, young turkey hen lies flapping in the leaves. Since her birth in May, she had survived the threats of disease, inclement weather and natural predators. With the coming of fall, however, a new predator has appeared on the scene. Unlike its wild counterpart, who kills instinctively and with no comprehension of future consequences, the new predator acts with premeditation and with full knowledge that his kill may very likely mean the loss of the hen's potential first brood of 10-13 poults in the coming spring or in the spring thereafter. The new predator quickly approaches and claims his kill, but instead of proudly carrying it home, he hurriedly steals back to his vehicle hoping to depart unnoticed.

The new predator is a poacher and, as will be seen, you can help to curtail his activities in North Carolina.

Poachers fall into two categories: one leaves home fully intending to hunt turkeys illegally; the other goes afield for squirrels, rabbits, deer or some other legal game, is confronted by a turkey at close range and despite passing feelings of remorse, finds the opportunity to bag a Thanksgiving dinner too much to resist. There is some tendency to feel compassion for the latter, but the end result is the same in either case—the loss of critical breeding stock that is needed to perpetuate the turkey in North Carolina.

Fall hunting for wild turkeys was practiced for many years in North Carolina, but has been banned since 1971 as part of a vigorous program to restore the species to all potential habitat.* The prime stimulus for this legislation was the realization that the turkey population had dwindled to dangerously low levels. Despite the small population, the state—especially its mountain areas—has thousands of square miles of potential unoccupied turkey habitat.

The objective of the state's turkey management program is to restore the turkey to that potential habitat and to manage it at a density that will permit a fall either-sex harvest in which all interested persons may legally participate. Although noticeable progress has been made in achieving this goal, it must be emphasized that even today North Carolina continues to possess the lowest number of wild turkeys of the southeastern states. Wildlife biologists agree that a continued ban on fall hunting is essential to bringing the wild turkey back.

Since a single turkey gobbler mates with a large number of hens, a rather large fraction of gobblers may be removed without affecting reproductive capacity. This fact is the basis for the current gobbler-only, spring hunting season, which is intended to begin after mating has taken

*The only exception to the ban occurred last fall when an experimental, either-sex hunt was conducted on U.S. Marine Corps lands at Camp Lejeune.

HUNTING THE RETURN TURKEY

by J. N. Weakly
President North Carolina Chapter
The National Wild Turkey Federation

place. But some hunters, reluctant to give up traditional ways, argue that fall hunting should be allowed to continue with the proviso that only male turkeys be taken. On the surface, this suggestion appears sound. However, experience has shown that even with such a restriction, many hens are killed—both accidentally and intentionally. It is sad but true that in fall and winter, the majority of hunters are unable to distinguish hens from young gobblers. Unfortunately the urge to shoot first and ask questions later is often too strong to suppress.

In spite of the ban, evidence suggests that many turkeys continue to be killed each fall. This probably results, in part, because the young birds are fairly easily called into shotgun range by the experienced turkey poacher and in part because the legal fall hunting seasons for other game allows the poacher to roam the woods with little chance of being detected.

The precise number of wild turkeys illegally killed each year is, of course, unknown. However, various studies place the estimate at from 3 to 20 percent of the total population. An intermediate figure of 10 percent would suggest that in North Carolina, a minimum of 150 birds are illegally killed annually. If half are hens; and if only half of these hens would have succeeded in raising only half of their hatch, a *conservative* estimate of the combined actual and potential loss of turkeys in the subsequent year would be nearly 500—an utterly intolerable and inexcusable situation! Whatever the true number, turkey experts agree that it is large enough to be a major factor contributing to the loss of wild turkeys. Therefore, it is a problem to be reckoned with.

At present in North Carolina there are only about two wildlife enforcement officers per county, so that even their most intense efforts alone cannot be realistically expected to be completely effective in curbing poaching. It also seems unrealistic to expect that enough license money could be appropriated to make enforcement by Wildlife personnel totally effective in preventing illegal turkey kills. Common sense then tells us that the burden of protecting the wild turkey from illegal hunting lies squarely on the shoulders of the honest, conservation-minded sportsmen. The only way to stop poaching of wild turkeys (and of other game animals) is for individuals to care enough to personally do something about it. This means contacting the wildlife officer in your area when illegal turkey hunting is observed or suspected. It also means that sportsmen may have to testify against violators in court. State law imposes a fine of $250 on individuals convicted of killing a turkey illegally, but in many cases, testimony of private citizens is essential for conviction.

To some the suggestion that the hunting community monitor the behavior of its own members may be viewed as a vigilante approach to the problem. It is! And it seems justifiable that we all participate since we are all affected by poaching. Keep in mind that every turkey killed illegally is at least one less (and very likely *several* less if a hen is taken) that might be available to the legitimate hunter during the spring season. In addition and perhaps more importantly over the long term, the activity of the poacher is too often identified as "typical" hunting behavior, which unjustly adds fuel to the fires of the anti-hunting camp at a time when it is very much unneeded.

One group of sportsmen which is attempting to do something about illegal turkey hunting is the North Carolina Chapter of the The National Wild Turkey Federation. This organization is dedicated to the wise management and conservation of the turkey. Its members have raised several hundred dollars to provide for a standing reward of $100 for information leading to the conviction of any person who kills a turkey illegally in North Carolina. The reward may be "claimed" through the efforts of the sportsman and the enforcement officer in his area. Wildlife Commission field officers have already been notified of the reward and instructed to forward to the Division of Enforcement the names of individuals whose information and participation were indispensible in obtaining the conviction. Following notification from the Wildlife Commission and appropriate corroboration, a check will be issued to the cooperating individual by the Federation. The organization hopes that this reward will help to encourage sportsmen all over the state to take a more active part in protecting our struggling wild turkey population.

Perhaps this reward and the stiff penalty for violators, combined with the development of a more protective attitude by individual hunters and landowners, will make the stakes too high for the poacher to continue to take the risk. For the sake of the wild turkey, let us hope so. ◆

Man and Dog... Since the Beginning

by Charles M. Rucker
Photo by The Author

I'VE often wondered what the difference is. Besides the obvious ones that pertain to species and physiology, there is something which sets the dog apart from the rest of the Animal Kingdom . . . especially concerning relationships with Man. A reason must exist for why we chose the dog to guard us against dangers in the night while we sleep.

Have you ever been driving at night and had the gas tank go dry? Well I have . . . twice. Both times I had to approach strangers' homes for the use of a telephone. Usually as soon as my hand lifted the latch on the front gate, or most certainly when my heavy steps resounded on the front porch, a dog inside the house would begin a frantic barking seizure. My embarrassed presence was made so obvious, so apparent, that the possibility of sleeping in the car until morning wasn't out of the question. Lights throughout the house came on quickly and there was the sound of rushing feet on wooden floors. Finally the front porch light came on, and a man who held something behind his back cautiously opened the door. At his slippers stood a Chihuahua with hackles raised, and ready to take on the world at slightest provocation. Under these conditions, I could almost come to respect the enterprise of a burglar!

On a busy street corner in New York City, a blind man waits for the traffic to clear. At length, his German sheperd gives a gentle tug on the halter. Trusting all well-being to his dog's judgement, they cross . . . safely. Having made the other side, both quickly disappear among the feverish and impersonal multitude.

It hasn't always been this way. For a million years man was hunted by predatory beasts. He was weak. He couldn't stand the cold, was full of fears and his flesh tore easily. He was legal game for the more numerous and larger predecessors of modern-day bears, tigers, and wolves. This trend was stopped, or at least reduced only when Man learned to hurl stones, generate fire, and most important—to think collectively. He began to reason. His brain was by now the largest and most complex of all creatures. He stood erect looking over the tall rushes and carried tools such as a spear or club. Plans were made to strategically locate and attack in co-ordinated efforts, animals many times his own size. Some of them being of the same species which had earlier attacked Man whenever given the chance.

The ancestors of the dog survived solely by killing the weaker or disabled, and out-running the stronger inhabitants of the Cenozoic forest. These dogs also knew the strength of numbers and roamed in packs. They possessed acute curiosity, excellent hearing, and the ability to read the wind with their incredible powers of olfaction—perhaps the best in the Animal Kingdom.

It is believed that these early wild dogs followed tribes of nomadic hunters for the bones they left behind. With the passing of time, dogs began to expect the remains from Man's kills, and were getting more impatient before investigating the warm ashes of his fires. This curious arrangement lasted into the millineums, spanning many generations of dogs as well as men. Gradually the duration of time shortened between the departure of the hunters and the arrival of dogs into the abandoned camps. No one is sure whether these prehistoric canines came within sight of the men and were captured and tamed, or if they actually overtook the nomads and finally walked into their camp expecting food. Either way, it is generally accepted that these dogs were slowly conditioned by the inadvertent rewards left by Man. This was the beginning of the greatest human-animal alliance the earth has ever seen.

It didn't take long for Man to realize that his new friend provided steady companionship on the long journeys through tundra, forest, and desert. The dog warned its master of any danger lurking in the darkness—beyond the dimness of tired embers. But on the hunt is where this semi-domesticated beast came into its own. Its sense of hearing and smelling began where Man's left off. And any creature that couldn't fly or retreat to the depths of the river was not safe from this inexorable invasion into the wilds.

By now, Man's conviction and wrath was carried on swifter legs than his own. From then on the dog had alienated itself from the rest of the Animal Kingdom, and had lost their trust in order to gain that of Man. Traitor to the deer, mountain lion, and even his own cousins—the wolf, coyote and fox, the scent of dog had become synonymous with that of the strange two-legged creatures which ride on the backs of fast horses and who use axes to diminish the forest. And now even the leopard moves with caution.

Yes, the story of how dog met Man and the affection which rose between them is a moving one. And yet every boy who has ever had a dog of his own during the formative years of youth—has his own miniscule and intimate version of this story.

For me, it was a cocker spaniel named Taffy. He taught me many things. I realized that a dog is capable of feeling and even responding to human emotions. After a baseball game which was lost due to an error on my part, I walked slowly home in the long shadows of late afternoon. My glove was held loosely in three

Of the many animal pets acquired by man over the generations, the dog seems to have attained one of the closest relationships with humans. Dogs as hunting companions hold a unique position of service and trust.

fingers, and Taffy padded softly by my side, equally deep in despair.

On occasion I was amazed by his courage. Picking fights with dogs twice his size seemed to be his idea of fun and with little regard for his chances of victory. Undoubtedly, dogs too have matters between them which must be settled one way or another. One recollection which fills me with tenderness and a certain amount of shame still lingers with my fondest memories. It was the time that I entered Allen's Hardware from the back door and left Taffy waiting for me on the iron platform at the top of the steps. Dogs were not allowed in the store, and I terminated my business at the cash register fully intending to turn and exit the same way as I had entered.

At this moment however, a fishing friend came in through the front door and we got to talking. He purchased a pack of plastic worms and several large hooks. Absently I forgot all about Taffy as we left through the front door en route to the drug store for Coke and crackers. After an extended sitting at the soda fountain, we decided to walk to his house for a look at a new spinning rod. I stayed there until I knew supper was just about ready at my house. Leaving his house, I started home. It was a lengthy course in the coolness of a late October evening. The house tops with television antennaes and weather vanes stood black against the sunset. Walking down the alley which led behind the stores, I noticed a small brown form sitting at the top of the stairs to Allen's. It couldn't be. With a few more steps, I could see that it was Taffy—still staring blankly into the metal door, waiting for my return. It had been over five hours. Spotting me at the bottom of the stairs, he immediately came rushing down. Happy to see me and yet bewildered at how I got past him unnoticed; he was not in the least perturbed as I would have been. We both walked home in the last of the light. He even seemed to think it was a pretty good trick.

It was two years later with his death however, that Taffy taught me the greatest lesson of all. Until this time, my life had not yet been touched by a death in the family and I somehow reserved this phenomenon for other people and their loved ones. The morning when I found my dog dead by the road, I was shown how close tragedy could strike as well as the ache of deep loss. For me this was something new. Since that day, I have felt it again in the passing of family and friends, but never any more intensely.

My story is not unusual. Every boy has a Taffy—it's that first great dog into which much love and fascination is channeled, and by which all others are to be measured. Today I own a fine Brittany spaniel, for which I feel the same compassion. It's something you don't outgrow. And in fact, I like to think that my fascination for the mysteries of instinct and absolute fidelity increase with my wisdom. Like before, there exists a strange rapport between my dog and me. I am being constantly reminded of this bond. Just the fact that my dog comes when I call him means that he understands that I have power over him. A more convincing example is when quail flush and sail over a frozen pond. I pick out a bird and it bows and tumbles to the ice. Without command, my dog runs out onto the pond with the ice groaning under him. Facing danger that even he must realize, the quail is fetched and given to me without hesitation. His only reward is a soft stroke on the neck.

In his famous book, *A Sand County Almanac,* Aldo Leopold also speaks of this same kind of devotion. "My dog does not care where heat comes from, but he cares ardently that it come, and soon. Indeed he considers my ability to make it come as something magical, for when I rise in the cold black predawn and kneel shivering by the hearth making a fire, he pushes himself blandly between me and the kindling splits I have laid on the ashes, and I must touch a match to them by poking it between his legs. Such faith, I suppose, is the kind that moves mountains."

The tracks of a man and dog have come down together through a good many centuries. From the first jackals that followed our ancestors to their cave, to my Brittany who nervously holds point and waits for the drumming of wild wings and the explosion of gunpowder . . . this unspoken trust has endured. What a wonderful and unique social relationship!

National Wildlife Federation Embraced 'Bowlegged Girl' 40 Years Ago

by Charles Roberts
Information Director,
National Wildlife Federation

IN a country where protection of the environment is a major national concern, the National Wildlife Federation has become the nation's largest non-profit, non-government conservation organization. It spends nearly $12 million a year on conservation education, research, environmental lawsuits and liaison with government agencies.

But the U.S. was not always so conservation-minded or conscious of its environment. In fact, when the Federation was born 40 years ago, in the midst of the Great Depression, conservation was such a low-priority issue among politicians that it was compared to a "bowlegged girl," shunned by suitors. The Federation nearly went broke embracing the "bowlegged girl" before the Congress and the country decided that conservation of natural resources, including wildlife, was a good investment.

This is the story of the National Wildlife Federation that emerges from a close reading of its archives —the story of an organization that nearly died in infancy despite the fact that it had a popular President, Franklin D. Roosevelt, for a godfather.

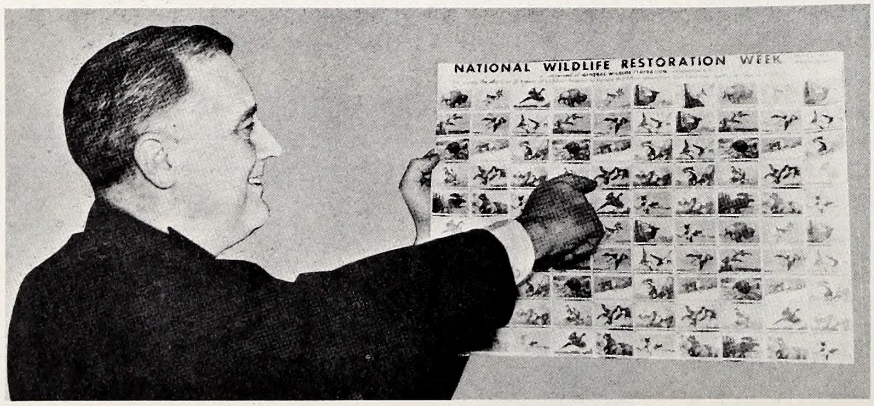
NWF was born in Washington, D. C. on February 5, 1936, at the first North American Wildlife Conference—a meeting called by President Roosevelt "to bring together all interested organizations, agencies, and individuals in behalf of restoration of land, water, forests, and wildlife resources."

Of the country's natural resources, wildlife, in particular, had been badly neglected in the five lean, mean years of the Depression, and so, in his charge to the conference, FDR expressed special concern over "the vanishing wildlife resources of a continent."

Time-stained records of that first North American Conference show that there was virtually unanimous agreement among the 1,500 conservationists on the need for a citizens' organization to coordinate the efforts of all conservation groups—and prod the federal, state, and local governments on conservation issues.

Jay Norwood (Ding) Darling, a Pulitzer Prize-winning nationally-syndicated cartoonist and conservationist, expressed that view to the delegates on Wednesday morning, February 5, the third day of the conference. Pointing to legislative victories obtained by labor unions working together, Darling said:

"To accomplish a systematic job of bringing the main issues to the attention of your elected officials you must first coordinate the groups of citizens who are interested in the cause of wildlife conservation. There must be a unified program as well as uni-



President Franklin Roosevelt (above) examines the first National Wildlife stamps. Jay N. ("Ding") Darling, long-time political cartoonist for the Des Moines Register, is shown at work on early Wildlife Stamps. Darling was a leader in many wildlife conservation movements.

fied pressure. We must have a network of connections between the various organizations through which we may communicate and act with some accord."

Darling, who had taken a leave of absence from the *Des Moines Register* to head the U.S. Biological Survey (predecessor of the U.S. Fish and Wildlife Service), was to see that sentiment translated into action before that day was over.

Before lunch, a St. Louis delegate, Paul O. Peters, moved "that it be taken as the sense of this meeting that an organization be formed as outlined by Mr. Darling."

The motion carried unanimously and applause rocked the Departmental Auditorium on Constitution Avenue—then known as the "Connecting Wing Auditorium" because it linked the Labor Department and Interstate Commerce Commission buildings.

Late that afternoon a "committee of thirteen"—with each member representing a different geographic area—presented a proposed constitution for a "General Wildlife Federation" to the assembly. Carl D. Shoemaker, then secretary to the U.S. Senate's Special Committee on Conservation of Wildlife Resources (and later an official of NWF), read the preamble:

"Believing that the natural resources of this continent are economic, social, recreational, and esthetic assets which should be restored and perpetuated for our posterity, and realizing that this can be achieved only through an aroused and enlightened opinion among the people of this Nation, we dedicate this federation . . ."

Before the delegates straggled back to their hotels, the proposed constitution had been adopted unanimously (on the motion of Delegate L. A. Colby, of Chicago) and Ding Darling had been elected Acting President of the new organization. Darling had often portrayed wildlife conservation as a "bowlegged girl" because it was ignored by politicians. One of the first messages of congratulations Darling received came from a former colleague at the press table: "The bowlegged girl of the village has at last been invited to the picnic."

That night, Secretary of Agriculture Henry Wallace brought greetings from FDR to the delegates at their banquet in the Mayflower Hotel and jocularly chided his fellow Iowan, Ding Darling, "for trying to incite you all to a revolution of some kind or other." Wallace expressed hope that the farmers, as well as wildlife, would "get theirs" in the distribution of federal funds.

The next morning, in a typical fire-breathing speech, Secretary of the Interior Harold Ickes attacked "despoilers of the land" and charged the delegates: "If we are to make common cause against them, it is absolutely necessary for conservationists of America of all shades of opinion to present a united front and to abandon the factional strife that has weakened our ranks in the past."

A little more than a year later, on March 3, 1937, delegates representing conservation organizations in 41 states met at the Jefferson Hotel in St. Louis, Mo., to ratify the constitution adopted at Washington and elect Darling as NWF's first president by acclamation.

At that first Annual Meeting, Darling urged the General Wildlife Federation (later renamed National Wildlife Federation) to make Wildlife Restoration Week (later renamed National Wildlife Week) its "Project No. 1." At NWF's request, the "week" was proclaimed by President Roosevelt the following year and has been observed annually since.

Ding Darling, who died in 1962, also invented another NWF tradition—the annual publication of wildlife stamps. In 1933, as chief of the U.S. Biological Survey, he had designed and painted the first federal migratory bird hunting license stamp. That stamp brought in $635,000 for the improvement of wildlife habitat.

Late in 1937, when he was seeking ways to keep the newborn Wildlife Federation out of bankruptcy, Darling received a letter from Kansas that asked: "Why don't you paint some wildlife pictures and have them printed on paper with glue on the back and sell them to lovers of wildlife all over the country?"

This suggestion from a letter writer (whose name has been lost to history) proved to be the financial salvation of the Federation. Darling painted the first set of 16 stamps himself. The first sheet of stamps received a windfall of publicity when it was presented to the world's then-most-famous stamp collector, FDR, on March 20, 1938, at the White House.

Since then the Federation has mailed out more than 6 billion wildlife stamps painted by distinguished artists. They are still one of the financial mainstays of the NWF.

In its early years the Federation was, by modern definition, a lobbying organization. It pressured Congress in 1937, for instance, for passage of the Pittman-Robertson Act, which has since produced more than $600,000,000 for states to acquire and develop wildlife areas by taxing hunters' guns and ammunition.

Later, in order to maintain its status as an organization capable of receiving tax-deductible donations, NWF gave up lobbying and shifted its main effort to conservation education. Today it publishes three popular magazines (NATIONAL WILDLIFE, INTERNATIONAL WILDLIFE, and RANGER RICK's Nature Magazine) and two more technical periodicals (Conservation News and Conservation Report) in addition to books and pamphlets that reach literally millions of readers.

NWF experts still testify before Congressional committees—but only at the invitation of those committees.

A substantial part of NWF's budget is devoted to its Resources Defense effort. Last year NWF won significant court decisions over four federal agencies it considered lax in the enforcement of environmental protection laws. It also broke new legal ground in an effort to curtail contamination of the seas by imposing restrictions on ocean dumping.

The Federation also works with schools by designing programs and providing audio-visual materials for nature and conservation studies. In addition to National Wildlife Week, NWF sponsors conservation camps, regional "summit" meetings, and national conferences to increase public awareness and support for the conservation cause.

With this broad program, the Federation has enlisted 3.5 million members and supporters in all 50 states, Puerto Rico, Guam, and the Virgin Islands in the struggle to keep the earth a viable planet.

Occasionally a new member will ask why an organization with "wildlife" in its name gets so involved in man's environmental problems. One of NWF's early directors, Justus H. Cline, answered that question nearly 40 years ago.

"Wildlife and human life are inseparable," Cline said in 1938. "It is necessary to conserve the one to save the other." ▲▼

Small World of a Coastal Weed Patch

by Paul Jennewein
Wrightsville Beach
Photos by The Author

ON almost any North Carolina beach, ocean swells, sand dunes and sea oats present a satisfying picture of what the environment of a coastal ecosystem should be like. It's the big picture.

Fewer people notice, however, the smaller scene. If you take closer look, a whole new world unfolds. Animals and flowers which are normally considered nuisances fill this world with a beauty of their own. If you stop to look and be the silent observer, the weeds will come to life and small creatures will play their colorful parts.

Many children know the world of the weed patch. In the curious age, they have the time to stay still and look. They can spot the beauty in the tangle of vines, the colors of a weed flower and in the shapes of the various burrs and prickly sand spurs. They may not be able to put into words what they see, and something may momentarily distract their attention, but being closer to the life forms and curious, there's instant appreciation there.

It's wildlife carried on in a small area. And, for an example, a typical 10-foot-square area at Wrightsville Beach was selected at random (or was it perhaps picked to defend it from those who contend the patch looks too messy for the neighborhood of manicured lawns and neatly tended flower beds?).

Sea oats (*Uniola paniculata* Linnaeus) in this patch send up their blooms around the first of July. The sheath of cane bursts out on top with several fronds and the rudimentary diamond-shaped grains. About mid-July, pollen emerges from the central sections of fruits, to dust wandering insects or to cascade down on the other seed sections as the breeze rustles the fronds. By August, the pollen is gone and the sea oats begin to turn to a golden tan—attractive to tourists, most of whom are unaware of the law that forbids plucking the fruit or damaging the root system on either public beaches or private property without the owner's permission.

Sea oats have a useful as well as ornamental purpose. Spread mostly by runners from an underground root-cane system, the reed-like leaves trap blowing sand and form a natural barrier to the movement of drifting dunes and ocean waters. The plant is one of the few which thrives in a salt-laden atmosphere. More effective, perhaps, is American beach grass, which remains in low-level clumps and is more apt to be planted to prevent rapid movement of sand particles and destruction of dune areas.

Those who like color will be attracted to the Gaillardia, the red and orange daisies that bloom 10 months out of the year. The Torch Light variety (*Gaillardia pulchella* Fougeroux) has made North Carolina's coastal beaches its home, although originally, it was a cultivated plant, for which seeds are still available from commercial sources.

The color runs from yellow to dark crimson, with the flower of red with yellow tipped petals predom-

The more common form of Gaillardia, a coastal beach wildflower, is shown above. A bee-like fly clings to a yellow dwarf aster (above right). This variety of a "three-toothed" land snail, Tridopsis hopetonensus obsoleta Pilsby, right, is found only in an area of North Carolina between New Bern and Southport.

inating. The plant requires little moisture and only a few teaspoons of soil in which to establish a root system.

As you might expect, a legend has developed on how it was introduced. All plants found at Wrightsville Beach, according to the story, came from a single packet of seeds, planted at the beach during World War II (the general date for the first substantial settlement by more than a few year-round residents) and then gradually flourished along the coast.

Common, too, is the sweet pea vine to most areas of a coastal beach. While no commercial use has been found for a typical pink variety (*Lathyrus latifolius*), it manages to serve as cover for lizards, snakes and the insects on which these harmless reptiles feed. Close up, Lathyrus has an exotic or oriental appearance, a bit of fascination in a half-inch wide bloom.

Smilax, another vine growing in more than one variety at the beach, has a better grasp on the environment. Its twisting, turning vine ends reach out in pairs and entangle other weeds and grass so that in a few weeks it has overwhelmed them. But it has its arabesque beauty, too—the slender, sinuous look of a spidery ballet dancer and its light, yellow-green contrasting with the dark green of the main bush.

Toward the fall of the year, there are other colorful additions—the dwarf asters in yellow, blue and orange, and goldenrod—along with the real nuisances of the season—sand spurs.

If some commercial application could be found for the sand spur, fortunes could be made. Southeastern North Carolina grows the healthiest and biggest. It could be one reason why the area has resisted the growth of real estate developments for so long—and therein, perhaps, it derives its usefulness.

But with a sharp eye or closeup attachment on a camera, you can see the rare and fascinating beauty of a sand spur and why its sharp spikes can so readily take hold of the fuzz of a passing furry animal, bird or pet—as well as penetrate clothing and bare skin.

Almost all the blooms in our weed patch have their insect visitors or inhabitants—the shiny, miniature versions of bluebottle flies; the fuzzy, beelike ones, wings iridiscent in the sunlight; beetles, scurrying over a myrtle leaf or exploring the nectar region of a flowering weed.

And on the ground level, past the ubiquitous ant hill, you turn over a board and there's a new world of strangers. Sow and pill bugs, crickets, occasional whitish termites and land snails.

Three varieties of land snails make their home in the patch, all apparently living in harmony, although one is a foreign predator. Rarest of the three is the Florida Amber Snail (*Succinea luteola floridana*). More common is the Hopeton Forest Snail, except that the variety found at Wrightsville Beach has been found only in the coastal section between New Bern and Southport and is dubbed scientifically *Tridopsis hopetonensus obsoleta* Pilsbry. Most common is the Decollated Awl Snail (*Rumina decollata*).

The Decollated Awl Snail is the foreigner, hitchhiking a ride to this area from the Mediterranean and landing somewhere between the ports of Norfolk, Va., and Charleston, S. C., during the latter part of the 19th Century, from where it spread along the coast and inland.

Unfortunately, the snail eats both vegetation and other snails, being omnivorous, and it may eventually take over the habitat of the other two native varieties. Curiously, William G. Binney, a Charleston biologist who studied snails in the 19th Century used the Decollated Awl Snail to help clean out other snail shells for his collection.

The weedpatch world is a new experience from top to bottom in each new region. It's a delicate world of forgotten beauty—and it only asks you take the time to look.

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

Hunting Seasons Open

October ushers in many of the hunting seasons in North Carolina and hunters are urged to secure a copy of the Hunting and Trapping Digest where hunting and fishing licenses are sold. An abstract of Federal regulations pertaining to migratory birds is also available from these dealers.

Wildlife Art Exhibit Expanded

The Eighth Annual N. C. Wildlife Exhibit has been scheduled for December 2, 3 and 4 in Raleigh's North Hills Shopping Center. It is being expanded to a regional exhibit and will seek out-of-state artists as well as North Carolina artists. Those interested in exhibiting works should contact Wm. B. Little, 3317 Landor Road, Raleigh, NC 27609. Details will appear in next month's magazine.

Bear Season Changed

The 1976-77 bear hunting season has been changed as follows: October 25-November 20 and December 13-January 1 in and west of Stokes, Forsyth, Davie, Iredell, Lincoln and Gaston counties.

Carolina Conservationist Program

This program, designed to benefit nongame Wildlife in North Carolina, was launched in the July magazine and has been featured at several displays throughout the State. Participants contributing $5 or more receive a decal featuring a portrait of the red-cockaded woodpecker. Contributions of $25 or more receive a 16 by 20 inch full color lithograph of a painting of a red-cockaded woodpecker pair. This limited edition lithograph is numbered and signed by the artist. All funds go to projects designed to aid nongame wildlife species in North Carolina.

Conservation Mini-Summit

The North Carolina Seashore Conservation Mini-Summit, sponsored by the N.C. Wildlife Federation, N.C. Agricultural Extension Service Forestry Dept. and the National Wildlife Federation is scheduled for November 4, 5, 6 at the Ramada Inn near Atlantic Beach. For more information on this exciting event, write: Chas. R. Shaw, Mini-Summit, N.C. Wildlife Federation, P.O. Box 10626, Raleigh, N.C. 27605.

Do You Know the Green River?

It Doesn't Flow Through Muhlenberg Co.

by An Painter
Photographs by Sam Thomas and An Painter

PHOTO BY AN PAINTER

● In North Carolina there is a river, green in color, narrow, swift in some places and dammed in other places, and it flows through Polk and Henderson counties. In this series of three articles, I hope you can get to know the Green River. It is beautiful: peaceful and rough, neglected and at the same time the center of a raging controversy. The Green River is being loved to death. This first article deals with the land and the river. Next month you will visit the Green: the gorge, the cove, and Bradley's Falls. Finally, when you most want to go there, the third article will discuss the many conflicting management problems in the Green: the resource and its vulnerability.

The Land

The farmlands around the Green are rolling hills cut here and there by the Broad River, and set in relief by the Blue Ridge range to the west, and by the peaks of Brushy Mtn., Cove Mtn., Howards Gap, and Cliffield Mtn. The source of the Green River is in the Blue Ridge mountains. For its whole length the river is never far from South Carolina's border—10 or 15 miles. But to the north are many familiar North Carolina landmarks: Chimney Rock, Lake Lure, the isothermal belt. Some of the cities nearby are Hendersonville, Tryon, Saluda, Forest City. The Green River begins near the Tennessee Valley Divide, separating waters which flow east to the Atlantic from other water which finds its way to the Mississippi.

The rich and diverse geology at the source of the Green suggests that perhaps the river once flowed to the French Broad drainage- to the Mississippi rather than to the Broad drainage and the Atlantic. Some ancient Triassic continental plate shifts altered the original drainage basins.

In the Narrows the swirling waters run over exposed bedrock at least 500 million years old, now worn smooth by the force of the river waters. Most of the rock associated with the countryside however is schist or gneiss. The sides of the gorge and the Narrows are yellow-gray crumbly rocks, and the granite is revealed only under the river's path, or with the boulders along its route.

Snows may have also created rockfalls visible along the Blue Ridge, particularly a structure, called a "cirque," on White Oak mountain, the worn ridge rising to the south of the Green River. This is a great scar on the mountain's shady side, visible for miles.

Another striking feature in the area is the Blue Ridge front itself: the edge of the mountains. From the high scarp you can see east along the Piedmont for miles. The drop to the foot of this escarpment is greater in two miles than the drop for the remaining miles to the sea. The Dept. of Transportation is attempting to put a highway in at Howard's Gap, along the edge of this scarp. Although the view is tremendous, so are the mudslides.

The River

The Green starts in the creeks draining Standingstone Mountain, on the border of South Carolina. About ten miles downstream the river broadens to a wide lake. When the Green was dammed in 1920 for the Tuxedo Hydro plant, Lake Summit was created. There are several popular summer camps on Summit's shores. Lake Summit is just south of Hendersonville. Below the power station's flume the river flows over a very rocky channel, cut into bluffs or cliffs on either side, gradually steepening, and the rate of descent gradually getting sharper.

The water level in the Green River is controlled by releases from the dam at Lake Summit. Although the river section below the powerhouse to the Narrows is beautiful and rugged under any flow condition, the amount of water changes drastically within a week. Duke Power generates electricity at the Tuxedo Station by releasing water through the flume channel, and the

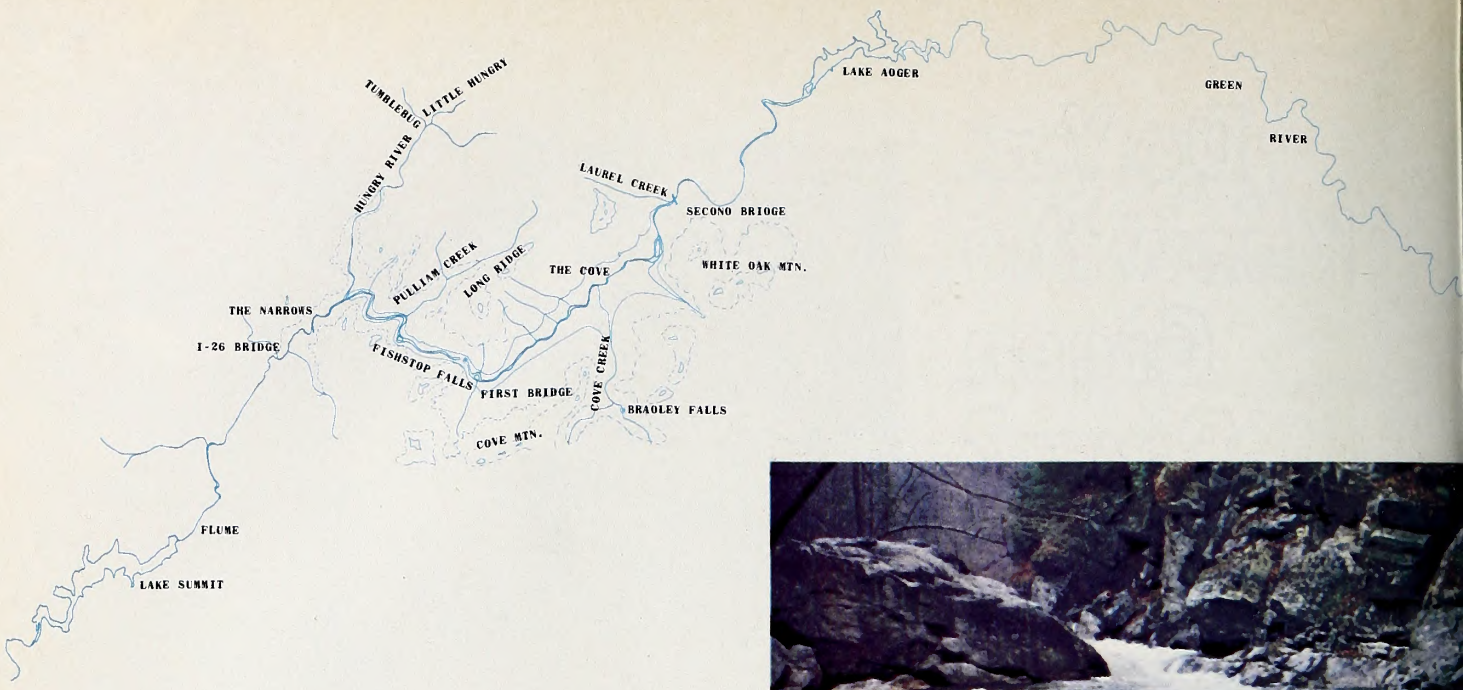


PHOTO BY SAM THOMAS

The Green River is actually green when road sediment and other erosion isn't being washed in. You have to catch it right to see its true fascinating color. This aerial view shows the tumbling river with its quick succession of rapids.

PHOTO BY SAM THOMAS

water is used again downstream at the Turner Hydro Station to generate additional electricity. The Turner Station uses the water impounded in Lake Adger, formed by damming in 1925. Both dams, working together, regulate water flow to Duke Power's Cliffside Steam Station, on the Broad River downstream from Lake Adger.

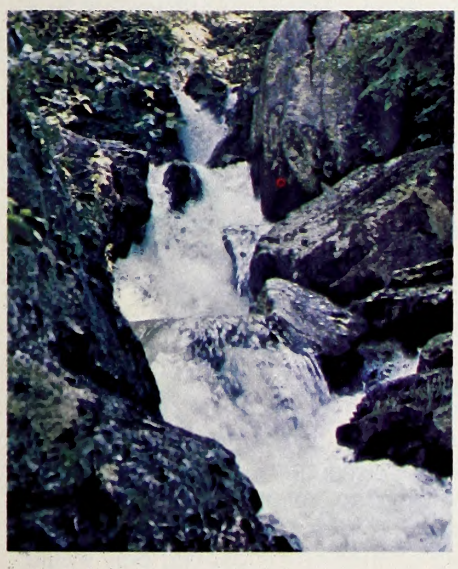
As well as generating peak electrical power, this setup provides cooling water for Cliffside. Although power needs would best be served by generating on weekdays, Duke is required to meet recreational needs, and usually cooperates with the scores and sometimes houndreds of tubers, canoeists, rafters and fishermen who use the Green on the weekends; only during periods of power generation is there sufficient flow for these recreational activities. This arrangement is best described as an uneasy truce.

The major tributary to the Green at this point is the Hungry River. At its confluence it is not very accessible, but its two creeks, the Tumblebug and the Little Hungry, are all too accessible. There has been a gravel washing operation on the Tumblebug which has kept the Green murky for the last six years. And the county roads which bring us to the Little Hungry provide tons of sediment to the Green each year. If the Green doesn't look green when you see it next, chances are the problem lies in the source of the Hungry River.

The increasing drop of the Green River as it plunges through isolated mountainsides is one of its most appealing features. As the descent steepens, the sides become a gorge through which the full River roars.

PHOTO BY SAM THOMAS

PHOTO BY AN PAINTER



SAM'S CREEK

PHOTO BY AN PAINTER

The Green River presents many faces, but fast water with numerous falls and cataracts provide one of its prime claims to fame. Canoeists (lower left) should select river portions carefully and even then be extra cautious with the tricky Green. The scenic river has many users and conflicts must be resolved and the stream saved.

The I-26 bridge crosses the Green at a point just above the Narrows, the gorge's most spectacular constriction. The river is 1300 feet below the high ridges to either side. It funnels through the Narrows in some places no wider than 15 feet. The rate of descent along a mile and a half here is one foot in 15.

Below the Hungry's entrance into the Green are several islands within the Narrows. Another tributary, Pulliam Creek, comes into the Green near one of these islands.

Leaving the Narrows till the second article, the next feature along the Green's route is Fishtop Falls. which can be reached by a short walk from a road, rather than the almost impassable route through the Narrows itself. Here the river begins a more gradual descent, widening a bit, and the cliffs become less steep, though they still rise 1100 feet above the Falls.

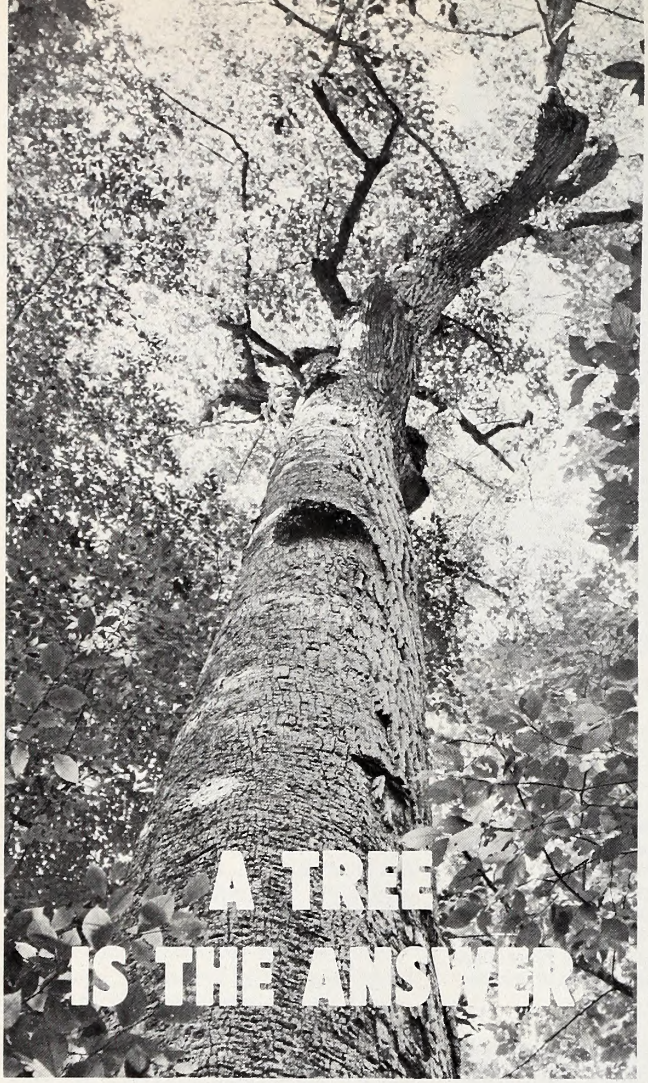
Now the character of the Green changes, seven and a half miles from Lake Summit, to a swift, occasionally deep, rock and island-strewn but also calmer river. The Green flows through the Cove. On both sides the flood plain stretches out, sometimes for 500 feet. The mountains which formed the gorge no longer crowd in on each other. They are still 2100 feet tall, but now they open onto ridges: Cove Mountain on the south and Long Ridge on the north. The river has a sandy and rocky bottom with sandy and pebbly sides. The river is no longer white, it is green (if you are lucky).

Another tributary, Cove Creek, flows into the Green from behind the eastern edge of Cove Mountain. Upstream, 300 ft. higher than the river, the creek drops 60 ft. from deep granite overhangs, forming a twin waterfall named Bradley's Falls. Some of the first people in this region were Bradleys, and a few Bradleys remain in the Cove. The entire Bradley Falls area will become property of N.C. State University—its Agriculture section. Much of the land in the Cove is owned outright or managed by the Wildlife Resources Commission. 6,000 acres along the Green are owned through a timber company subsidiary of Duke Power. Other land ownership involves plans by EPIC, another utility, and by developers, and will be explored in detail in Part III.

The Green carries an extraordinary amount of sediment into Lake Adger. This lake is gradually outliving its usefulness as a power source and as a lake; it is now almost completely silted up. Its shallow marshes attract bird lovers, flatwater canoeists, rowboat enthusiasts, fishermen, and powerboaters galore.

Below Adger's dam, the green flows placidly along a twisty, bendy route for about 15 miles before it flows into the Broad River near the Rutherford County line. This stretch lends itself to recreation use also, but is not so popular as upstream waters. Water quality, under the almost useless current state classifications, is "C" for everything below Lake Adger, and "C trout stream" above. There are trout on the Green—in spite of the terrible sedimentation problems.

Lured by tales of the marvelous Green River, told by Sam Thomas, I resolved to visit this wonder before it lost its charm; the Green river is beset from all sides by special, conflicting, interests. Too many people are loving the Green to death. So Sam promised to give me a tour, and we packed cameras, I packed courage, and we visited the Narrows, the raging river itself, Bradley's Falls, the Cove, and Fishtop Falls. ⬍⬍



by Dale L. Flesher

THE pollution and deterioration of our nation's environment seems like a monumental problem that is beyond the realm of the ordinary person. Most citizens would like to help save the habitat, but they are uncertain as to what steps to take. One answer to the problem of pollution is the planting of trees.

Trees are an effective pollution fighter. Trees can catch the pollution in the air and hold it until the next rain washes the particles into the ground where they will not clog our sinuses. Trees will not only clear the air of pollution, but will release fresh oxygen as well. More trees in our downtown areas would do much to freshen and clean our cities. Trees can also fight noise pollution. Many property owners are already familiar with the manner in which a grove of trees or a high hedge can limit the amount of noise created by a nearby expressway.

Trees even become an environment within themselves in that they provide homes for birds, squirrels, and other small animals. As long as these wildlife creatures can survive, man will be able to survive as well.

There are psychological advantages offered by trees also. A tree, or grove of trees, can provide not only shade, but also a quiet area where a person can unwind and forget the troubles and cares of the day.

As the heart of the autumn season approaches, people are reminded more than ever of the importance of trees to the community. The leaves are now turning to varied hues and many individuals will soon be taking weekend trips to observe the beauty of our nation's forests. Autumn is the time when trees lose their leaves in preparation for a winter's sleep, but autumn is also the time when young trees should be planted. Anyone who wants to take a part in the war against pollution should take this opportunity to plant a young tree.

The planting of a tree is one of man's most significant acts. It is a symbol of his faith in the future, a monument to his desire for beauty in his surroundings. A tree is something that can be appreciated for a lifetime. In addition, it gives the planter such a feeling of accomplishment to see a small twig that he has planted grow into a sturdy tree.

If a person desires a special type of tree (such as a flowering tree or a fruit tree) it can be acquired at a very low cost from a nursey. Trees can also be acquired from mail-order nurseries. If a person is less particular as to the type of tree he wishes to plant, he can probably acquire one free of charge from the woodlot of a farmer friend. Whatever the source of a tree, its successful growth could add hundreds of dollars to the value of a piece of property.

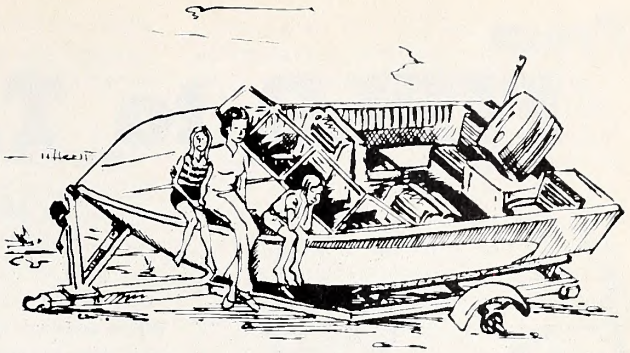
Once a person has decided to plant a tree, the question often arises as to where the tree can be planted. In addition to a person's own property there is the possibility of planting trees on school and community properties. Planting trees on community owned land is an ideal project for Boy Scouts, Girl Scouts, 4-H clubs, and school classes. For apartment dwellers there is always the possibility of planting a potted tree on the roof of the apartment building. Probably the most overlooked tree planting area is highway rights-of-way. Cars and buses are major contributors to the pollution problem and it is not uncommon to see clouds of pollution hanging over our more heavily traveled expressways. Why not make an attempt to solve the problem by planting thousands of trees along highways and on median strips? Not only would the trees absorb the pollution created by autos, but they would abate much of the noise that an expressway yields. In addition, the lumber from the trees could be a future source of income for the state and federal governments.

There are millions of acres of land in this country that are completely unproductive simply because they are located next to a highway. Why not start growing a profitable crop on that land and at the same time improve our environment? Mention this idea to your legislators, both state and federal. The cost of implementing such a tree planting program would be low and we would all benefit from the beauty and clean air that would result.

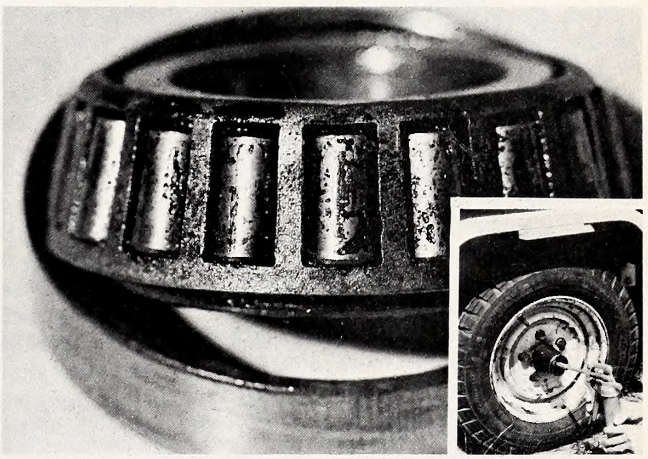
Many of our most pleasant hours are spent in the shade of trees. From early spring until the hickory nuts are ripe in the fall, trees bring joy to everyone. Let us plant trees and we can view our accomplishment for the rest of our lives. ⬍

Stem to Stern

BY ED JENKINS



A scene like this (above) may have resulted from a trailer bearing like this (below). The corrosion and pitting of the bearings was caused by salt water getting into the wheel hub. It had to be replaced after only one year. A quiet squirt of grease (insert) is all it takes to protect wheel bearings with a Bearing Buddy installed on the hub.



• Having a wheel come off a boat trailer especially on a long distance trip is an unpleasant experience to say the least, but one for which every person who trailers a boat should be prepared. Most boatmen carry a spare tire for their boat trailer, and some of these even carry a jack that will fit the boat trailer. However, the most damaging and expensive trouble trailer boaters can have is losing a wheel due to wheel bearing failure, and how many people carry a spare hub or wheel bearing and a can of lubricant with them?

Wheel bearing failure is usually caused by water, especially salt water, getting into the hub of the wheel through the rear grease seal during launching and recovery of a boat. When a boat that has been trailered some distance is backed down the ramp and the hub of the wheel comes in contact with the water, the air space in the hub contracts and sucks water and grit into the hub past the rear grease seal. This water is trapped in the hub and slowly eats away at the bearing causing it to finally fail with the result more than likely being a costly on-the-road breakdown.

Even if a boat owner is able to keep the trailer hubs out of the water while loading and unloading his boat, the wheel bearings should be repacked with grease annually to keep them properly lubricated to avoid excessive heat buildup.

One of the proven philosophies of the American way of life is whenever there is a problem or hinderance, someone will find an answer or a way around it. Such is the case here. A firm in California called Aquaappliances is manufacturing a device they call a Bearing Buddy® which virtually ends wheel bearing problems.

Bearing Buddy prevents wheel bearing failure by keeping water and dirt out of trailer wheel bearings. A spring loaded piston maintains a slight (3 psi.) pressure inside the grease-filled hub. As long as there is more pressure inside the hub than outside, contaminants cannot enter.

When installing a pair of Bearing Buddies on a trailer that has been used, the bearings and seals should be cleaned and inspected for wear. This is not necessary on new trailers. If the bearings and seals are okay, then fill the hub completely with grease. A non-fibrous, lithium base, multi-purpose lubricant such as used on automobile chassis is recommended. Waterproof greases are not necessary, because water will not enter a properly filled hub. After the wheel has been replaced on the axle, just replace the grease caps with the Bearing Buddy. Some air may be trapped in the hub but will work its way out. Because the hub is full of grease, bearings always receive proper lubrication.

The lubricant level should be checked just prior to launching by pressing on the spring-loaded piston. If the piston can be moved or rocked, the hub has sufficient grease. If not, the user should add grease with a hand gun to move the piston outward about 1/8". There is a tendency to add too much grease. It's the old story that if a little works, a lot more will work a lot better! Once the hub is full and all air is evacuated, grease should be added to maintain the piston 1/8" from the seated position. Don't overfill. The excess grease will just come out the front of the Bearing Buddy and make a mess. Never use a high pressure grease gun such as service stations have to fill Bearing Buddy. The pressure will damage the rear grease seals.

Bearing Buddy generates a 3 psi. internal hub pressure and will not damage an adequate seal. The rear grease seals on a new trailer should withstand 20 psi. internal hub pressure; however, with age, seals will wear and some grease leakage may result. If the trailer doesn't have brakes, a little grease leakage will not hurt. With brakes, no grease leakage is tolerable because the grease could get onto the brake linings and decrease braking effectiveness. Worn seals should be replaced.

Bearing Buddy is carried by most marine dealers and costs less than a set of replacement bearings and seals. They are a very worthwhile investment for the serious-minded boater who wants to care for his equipment but doesn't want to be bothered with cleaning and repacking his trailer wheel bearings several times a year. A luxury? Yes, but a luxury that will give you more time on the water with less worry, and that's what you want. Isn't it? ⬍⬍

From FIELD to TAXIDERMIST

by Nelson Horton
Nelson's Taxidermy
Apex

TROPHY deer, unusual waterfowl, record bass or other game and fish worth mounting are usually the results of long hard hours afield in some pretty rough weather. They're most often "once in a lifetime" experiences and represent a lot of work and money. How great it will look in the den or office; but what do you do until you get it to the taxidermist? The following suggestions will help you get a good job, and certainly they will assist the taxidermist in getting the results you both want.

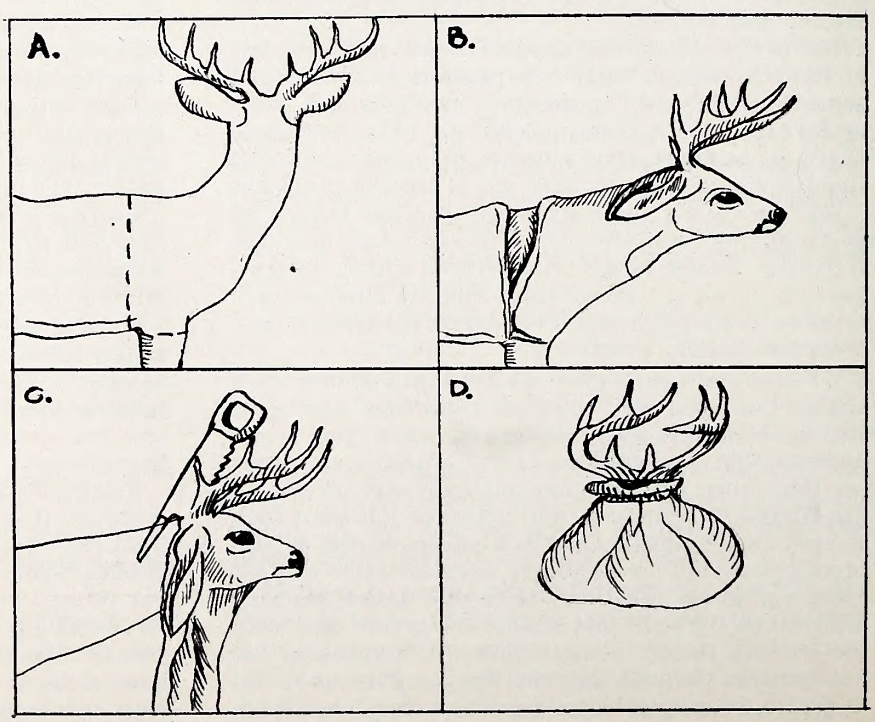
Gameheads: (Bear, Boar, Deer, etc.)

Extra care and pride in the field are essential if you want a first-rate mounted trophy you will be proud to display. In discussing the care that should be given to big game animal head trophies, the white-tailed deer will be used as an example, but the procedures outlined apply to most big game.

An error often made by hunters after the animal is down is the cutting of the throat to bleed the animal. This is the puncturing of the throat or neck region with a knife. DON'T. The same results can be obtained by sticking a deer far back under the brisket, where you start the gutting procedure. Try to avoid any unnecessary cuts on the deer since this often causes blood to permeate the hair and the initial cut can also make a nasty hole, which very seldom sews back in such a way that is not noticeable on the mount. Such a slice also results in a great deal of hair being cut when the knife penetrates.

After the deer is gutted (internal organs removed), the next step is to transport the deer from the woods. If at all possible, it is best to carry the deer out instead of dragging it even though this may require two or more people. Dragging is not best because it may cause hair to be broken and pulled out. If you have to drag the deer, try to protect the hair by lifting up on the antlers while dragging the carcass. Once you have the deer at the desired destination, proceed to skin the deer, separating the head and cape (skin) from the body. Behind the shoulder or front legs, make a neat cut all the way around the deer. After this circular cut, pull the skin up as far as possible on the deer's neck and to the back of the skull. A knife may have to be used to separate the skin from the body. Try to be careful when using a knife not to cut the skin.

After the skin has been pulled up as far as possible, disconnect the head from the neck with a knife or saw. This also saves more venison for the table. If you have the chance to get the head to a taxidermist during the day or within a few hours after the kill, this is best. If not, try to get the head into a freezer as soon as possible until it is convenient to carry it to a taxidermist. All that is necessary in this case is to put the head in a plastic bag and place it in the freezer. In a freezer, the head will keep for



many years, but it is not recommended that the head stay in a freezer for a long period of time. The reason for this is that the skin itself, the ears, and mouth area may become freezer burned (dried out due to exposure to freezer air).

If you wish to keep the remainder of the deer's hide for a rug, etc., it is recommended that it be frozen in the same manner as head and cape. If you desire to have gunracks made from the deer's hooves, separate the hoof from the leg at the knee joint with a knife or saw. Freeze the hooves in a plastic bag.

Small Animals: (Bobcats, Foxes, Squirrels, etc.)

The preparation of small animals to be mounted is about the same as described for gameheads. However, the hunter is most likely to want a full mount instead of the head mount alone. The first step in caring for small animals, as well as any game to be mounted, is to remove as much blood and dirt from the animal as possible, and to plug large shot holes. A cloth or paper towel can be used to absorb the blood and dirt. Removing the blood from the hair before it has dried is much easier, but if the blood has dried, you can take a cloth or paper towel, moistened with cold water, and remove most of the blood from the hair. The point is to strive to keep the animal as clean as possible. You are now ready to wrap the animal in newspaper, freezer paper or preferably in a plastic, airtight bag for freezing. At your earliest convenience, get it to a taxidermist so further proper care can be taken and mounting completed.

Birds: (Ducks, Geese, Pheasants, Quail, etc.)

When retrieving a bird which you plan to have mounted, it is best to pick up and carry the bird by its feet. This helps prevent ruffling the feathers any more than necessary. As soon as possible, plug the mouth, vent, and shot holes with cotton, paper, or scraps of cloth to prevent blood or bloody fluids from soiling the feathers. Birds may be wrapped in newspaper, aluminum foil, or placed in a plastic bag for storage in a freezer. A cone made from newspaper is also acceptable. Place the bird in the cone, head first, if this method is used. Take caution not to ruffle feathers when wrapping it. It is also a good policy to wrap the bird's feet (feet only) in a damp or wet cloth before freezing. This help eliminate the chances of the bird's feet becoming freezer burned.

Fish: (Freshwater and Saltwater)

When a fish has been caught that you wish to have mounted, try to handle it carefully so the scales will not become loose. Don't gut or otherwise cut the fish. This can later result in a poorly mounted trophy because these cuts are very hard to conceal. Keep the fish in water or wet, if possible, at all times. This keeps the skin and fins from drying. A good procedure to follow is to ice the fish down as soon as possible to prevent spoilage. If you do not have an ice chest and plan to continue fishing, place the fish in a shady area. This will aid in preventing the fish from drying out and spoiling as rapidly. A wet cloth or several layers of wet newspaper will usually keep a fish in good condition for several hours.

If you wish to freeze the fish before getting it to a taxidermist, wet the fish down and freeze it in an air-tight plastic bag. Freezer wrapping paper can also be used but it is suggested that you wrap the fish in a wet towel before wrapping it in paper. Always try to place your fish in such a way that it will freeze in a flat and straight position. At your earliest convenience, it is advisable to get your fish to a taxidermist since the skin and fins can freezer burn if frozen for too long.

These suggestions are made mainly for the safe keeping of trophies in a freezer. In any case, if access to freezer space or immediate attention by a taxidermist is not available, salting of the skin or hide or dry ice would be alternatives. If you are interested and want detailed information on skinning gameheads or animals, fish and birds, it is best to ask a taxidermist before attempting this task.

Remember that you earned that trophy. These few helpful suggestions should result in a quality mount. Whenever in doubt about the proper way of the caring for or keeping your trophy until it's in the hands of a taxidermist, call him first and inquire. Don't lose your head. ▲▼

For mounts of waterfowl and other trophies you'll be proud to display, make sure that you care for the specimens properly from the time that they are bagged until you deliver them to the taxidermist. Follow his instructions to the letter.

Duck Treat

by John Crew
Photos by The Author

The ring-necked duck comprises over 10 percent of all waterfowl taken in North Carolina in most Cooperatve Waterfowl Parts Collection surveys. He is a sporty and frequent visitor to the Atlantic Coast States. Although he is a diving duck that feeds on shellfish and crustacea, he is known to waterfowl fanciers as a tasty morsel, if prepared properly. And proper preparation means skinning to remove all fat and marinating to subdue any "gamey" flavors. While the whole fowl may be used, the best meals are restricted to the breasts. The following photos show you how to remove the breasts. After extraction the breasts should be washed and then placed in a deep pan, covered with cold, salty water and placed in the refrigerator. Leave the breasts in the refrigerator at least three days, changing the water as it becomes bloody. Next marinate the meat for at least ten hours. Any marinate will suffice, but a good one consists of dry cooking wine, olive oil, chopped celery and salt and pepper. After marinating, the breasts can be sauted in butter, covered with mushrooms and onions or broiled while basting with the marinate. Regardless of how they're cooked, the duck should be served wth brown or wild rice. That's living!

To remove the breast meat, lay duck on its back with wings outstretched. Insert point of knife under the end of the breastbone. By holding the fowl's legs and rear portion with knife and inserting thumb of other hand under the breastbone, the breast sections can be separated with a sharp pull. Cut meat completely free from remainder of body where wing joints attach.

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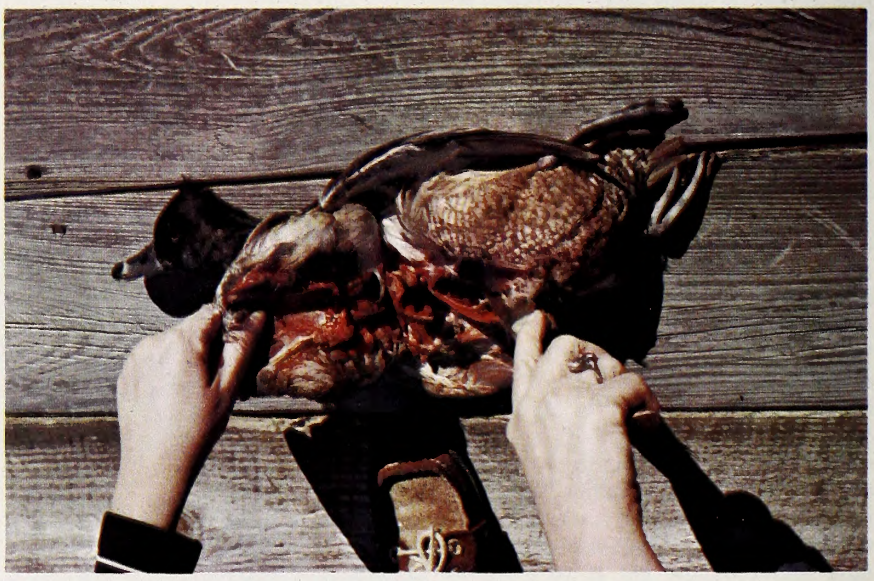

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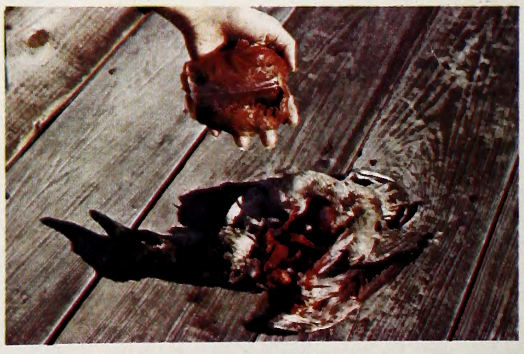
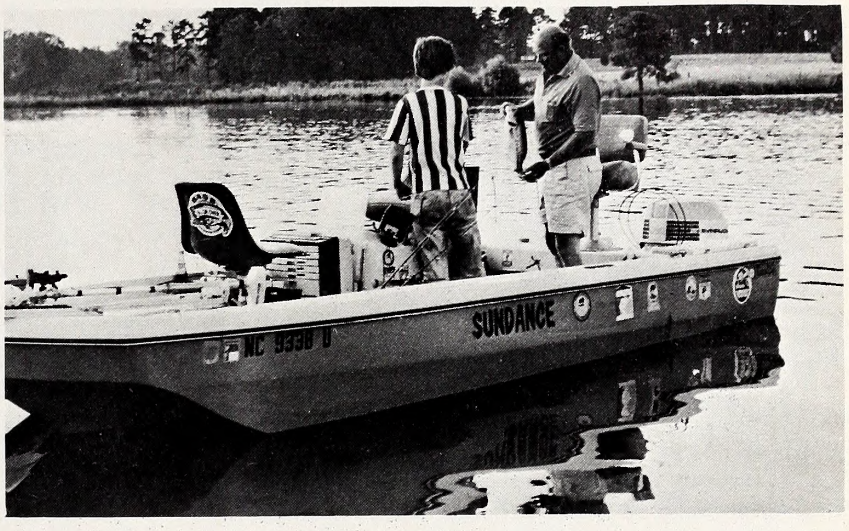


Carefully separate meat from skin and feathers by working slowly from edges of breast section (left). The breast section (above), about the size of a large hamburger, still has breastbone attached, which may or may not be removed. Soak and marinate as suggested in text.

PHOTO BY TOM ROLLINS

Is Sport Fishing Recreational or Competitive?

by Donald Baker



The following remarks by Don Baker, Chief of the Division of Inland Fisheries, were presented at the May meeting of the American Fisheries Society, Fisheries Administrators Section.

Several questions were posed by Bob Brewer when he assigned this topic. They were:

1. Are we after an experience, or trying to meet a goal?
2. Is the pursuit most important, or is the creeled fish?
3. Is the anticipation, planning and preparation for a fishing trip more significant than the return home with a limit or near limit catch?
4. Do fishermen want a few "trophy-sized" fish, or large numbers of average size?
5. Does a fishing trip include more than having fish available for catching?

The answers are "yes." Yes, fishermen are after an experience, and they often are trying to meet a goal. Yes, the pursuit is important—so is the creeled fish. Anticipation, planning and preparation for a fishing trip are significant but so is "catching the limit." Some fishermen prefer a few "trophy-sized" fish; others prefer large numbers of average size. And—a fishing trip does include more than having fish available for catching.

The answer to the topic question—Is sport fishing recreational or competitive?—requires that we explore the question "why do people fish?" I think people fish simply because it's fun.

The Sport Fishing Institute summarized this question very well in its September 1975 bulletin: "Sir Henry Wooton, mid-17th-century Provost of Eton College, said of angling: 'tis an employment of my time which is then not idly spent.' Isaac Walton described fishing as 'The Contemplative Man's Recreation.'

"William D. Ruckelshaus, keynoting the recent National Bass Symposium stated: 'People fish to catch fish, not necessarily to keep them, but to catch them.'" I like this one best: "Herbert Hoover asserted: 'The reason for it all is that fishing is fun and good for the soul of man.'"

Sport Fishing Institute stated further, "A 1973 survey of 524 sport salmon anglers on Vancouver Island revealed that the two most important motivations for their fishing trips were 'to take it easy' and 'to be outdoors.' A poll of anglers in the national capitol area, in 1958, revealed that their chief reason for going fishing was to *relax*. The second and third reasons given were to enjoy *companionship* and *pleasant surroundings*. Further insight comes from a recent behaviorial study of 1,436 canoeists and fishermen on the Au Sable River, Michigan. The need to escape temporarily 'from stressful conditions in the nonleisure environment' was a major motivation for those activities."

All this boils down to the fact that fishing is fun, it's relaxing, and it provides a change of pace and scenery.

I personally adhere to the contemplative type of fishing. However, I have never fished with a companion without having a feeling of competition—and enjoying it. Who am I, then, to say that tournament competition is not recreation, is not fun for those who prefer it?

As fishery managers, it is not our responsibil-

ity, or perhaps even our prerogative, to mold public opinion. Educate them, inform them, but I question whether we should attempt to tell them what type of fishing they should like.

It *is* our responsibility to manage. Management involves taking the resource as it exists and conserving it or enhancing it by monitoring the situation and adjusting regulations and factors affecting the resource so as to insure continued sport fishing consistent with long-term utilization without degradation.

That's quite a mouthful but this definition of management allows the fisherman the right to a choice of methods so long as it is not damaging to the resource. It also places the responsibility for management on the biologist. It is the manager's responsibility to control those factors that are detrimental to the resource—whatever the factor.

In summary, I suppose it doesn't matter whether fishing is recreational, competitive, contemplative, or commercial, so long as the managing agency retains the prerogative to manage and does so in a manner that insures equal opportunity to any individual who supports the program through purchase of a license.

I have here a copy of a resolution recently adopted by the South Carolina Wildlife and Marine Resources Department. The author of this resolution was closely associated with us in North Carolina for several years and the resolution contains ideas that we often discussed. It expresses my philosophy regarding tournaments so I submit it as such and recommend its consideration for those concerned with the effects of fishing tournaments on the sport of fishing.

Resolution

WHEREAS, The South Carolina Wildlife and Marine Resources Commission strongly endorses the contemplative concept of fishing for relaxation and for the inherent enjoyment of the sport and recognizes that in recent years there has been a dramatic increase in organized competitive fish-for-cash tournaments; and

WHEREAS, This upsurge in competitive fishing tournaments has created a new breed of fishermen who fishes with the best equipment and knowledge that modern scientific technology can provide—the so-called "fishing pros"; and

WHEREAS, These competitive tournaments and the fishing professionals have created a storm of controversy between themselves, other fishermen, the general public, governmental and private conservation agencies; and

WHEREAS, Research and evidence currently available indicates that professional fishermen are more adept at catching fish than the average sportsman, but that the total poundage removed from public waters during organized tournaments makes up only a very small percentage of the total catch from any particular body of water in any given year; and

WHEREAS, The competitive angler and his tournaments have provided a sound, but limited, resource for research studies on fish populations and fishing efforts; and many of the professional fishermen have proven to be leaders in conservation disputes with those who despoil our natural resources;

NOW, THEREFORE BE IT RESOLVED: The South Carolina Wildlife and Marine Resources Commission does hereby resolve that in an effort to minimize the conflicts that occur between fishing tournaments participants and other users of our fishery resources in South Carolina, it is in line with this Commission's responsibility to ensure conservation and wise use of such fishery resources to propose guidelines recommended for use by those sponsoring fishing tournaments in the public waters of South Carolina. While said guidelines are primarily intended for bass tournaments, their application seems equally proper for tournaments for other species. ⬍⬍

- Letters
- Comments
- This & That

BACK OF THE BOOK

Photographic Correction

Dear Sir:

In the August issue of *Wildlife*, I have found an error in the article "Shots Seen—Not Heard" by Linda B. Walters that may cause some confusion for persons not familiar with photographic films. Ms. Walters states that when daylight film is used indoors without a correction filter, the photographs will have a bluish overtone and when tungsten film is used outdoors without a correction filter the photos will have a red tint. However, just the opposite is true. Daylight film is balanced for natural sunlight, 5600°K, and when used indoors under tungsten lights without a correction filter the resulting photograph will have a warmer tone or yellow/red overtone. Tungsten film, as the name implies, is balanced for use under tungsten lights, 3200°K type B—3400°K type A, and when used outdoors without a correction filter will produce photographs with cooler colors or a bluish tint. I think it would be appropriate to print this information to help eliminate any confusion for beginning photographers in selecting the correct film for their intended use.

Sincerely yours,
C. W. Brickhouse

North Carolina Natural Heritage

With the inauguration of the Carolina Conservationist program (see July, 1976 "Wildlife in N.C.") by the Wildlife Resources Commission, I am pleased to inform you of the simultaneous beginning of the North Carolina Natural Heritage Program. The Heritage Program will establish a central data system

KNOW YOUR ENFORCEMENT OFFICER

Wildlife Enforcement Officer James E. Yaskiewicz, stationed in Lawndale, N. C., was born November 22, 1946, in Guilford County. He is the son of Mr. and Mrs. Bernard John Yaskiewicz of Greensboro, N. C. James is a graduate of Greensboro Senior High.

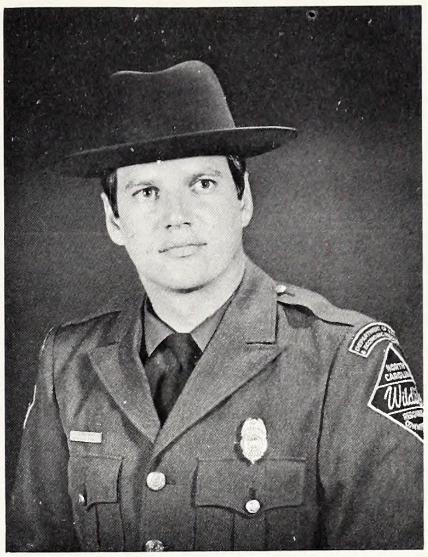
Prior to employment with the N. C. Wildlife Commission, he was a police officer with the City of Greensboro.

James completed the basic school for Wildlife Officers at the Institute of Government at the University of North Carolina at Chapel Hill in December 1970. He was employed as a trainee in the Division of Game in March 1971 and was stationed in Flat Top Refuge in Mitchell County. Under the new game lands program, he was transferred to the Division of Enforcement and stationed in Lawndale.

Since his intial employment, he has attended six in-service training schools including one eight-week school.

Mr. Yaskiewicz is a member of the Masonic Lodge, a Qualified Hunter Safety Instructor, and a member of the Southeastern Association of Game and Fish Commissioners.

James is married to the former Janice Rogers of Spartanburg, S. C. They have two sons, Darren age 7 and Jason age 4.



James E. Yaskiewicz

for North Carolina to inventory locations of threatened and endangered animals and plants, representative occurrences of the state's ecosystems and biological communities, unique geologic and aquatic features, and to identify outstanding natural areas.

This program is conducted in cooperation between The Nature Conservancy and the N. C. Department of Natural & Economic Resources. Financial support comes from the Mary Reynolds Babcock and Z. Smith Reynolds Foundations.

Our data collection system will consist of map files on natural features, geographic and species files, and computer retrieval base. We will assemble information on natural areas in public management, and will assist with protection planning and public educational services. Information gathered by the N. C. Natural Heritage Program will be available for the use of all public agencies, public works planning, scientific research, educational and conservation programs.

We are pleased to provide this complimentary support to the efforts of the Wildlife Commission, State Museum, Division of State Parks and Recreation, and others for the identification and protection of North Carolina's outstanding features of natural diversity.

Charles Roe
Project Manager
N. C. Natural Heritage Program

October Tide Tables for Rail Hunters Southport

Date	Day	Time	High Tide (ft.)
21	Thurs.	5:49 am	5.3
22	Fri.	6:43 am	5.6
23	Sat.	7:35 am	5.9
25	Mon.	9:22 am	5.9
26	Tues.	10:17 am	5.7
27	Wed.	11:14 am	5.4
28	Thurs.	12:12 am	5.1

This month's back cover is one of the series of six fish prints for sale at $10.40, available from the Wildlife Commission, 325 N. Salisbury Street, Raleigh, N. C. 27611. Bluegills, rainbow trout, brook trout, crappie and largemouth bass are others of the 11 x 14 inch prints ready for framing.

BEAUTIFUL BUT SAD

Fall of the year with its azure skies
Brings wonderful beauty to our eyes.
As warm sunshine filters through crisp air,
With a fall day, what can we compare?

Fall is so lovely, but very sad, too,
To think another year is about through.
For when a year leaves it comes back no more—
Kind of like losing a friend we adore.

What's more glorious than a night in fall,
When the full moon looks like a golden ball?
The early fall moon is called harvest moon—
What crops are out then will be gathered soon.

Sometimes I think of big bears on the prowl—
Then soon, I may be spooked by a hoot owl.
Pumpkins lying around the corn shocks.
Ofttimes I hear dogs chasing a fox.

Grasshoppers around in great throngs,
Are for sure singing their last songs.
Late flowers blooming now and then.
So much when gone will never come again.

Winging their way south are many birds,
Whose songs we have enjoyed beyond words.
If lucky, they'll be back with their cheer,
But I can't say as much for the year.

It won't be long till next New Year's day
Will come along, and push this year away.
So, what can we do but look to next year,
And hope it will be full of good cheer.

Robah C. Gentry
3216 Arlington Drive,
Winston-Salem

Smallmouth Bass

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Wildlife

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IN NORTH CAROLINA

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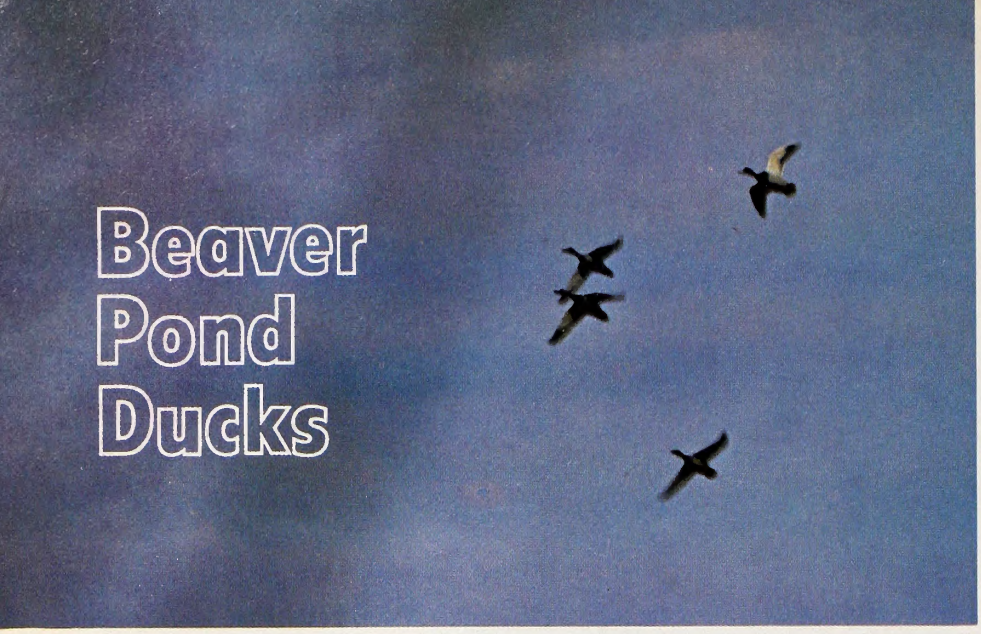
An objective of all levels of government should be to achieve and sustain a balance of the social, ecological, and economic benefits derived from natural resources. Without such balance none of the factors on the scale will be worth weighing.

Mallards explode from a Piedmont beaver pond in this scene from a painting by Duane Raver. The original painting was donated to the Raleigh Chapter of Ducks Unlimited for sale at their 1975 meeting. The meeting this year is at the Raleigh Woman's Club, November 11 at 6 p.m. Support your local chapter of this organization.

PHOTO BY LEONARD LEE RUE III

BIG BUCK

Things like this simply don't happen in "real life," you say. Well, the chances of catching a buck like this in the open during the season may be slim, but we hope you connect.



Beaver Pond Ducks

by John A. Crew
Greensboro
Photos by the Author

SEVERAL inland sections of North Carolina have thriving beaver populations. This phenomenon, plus the fact that part of the Atlantic Flyway crosses these areas produces, at times, duck hunting that could rival the better known coastal waterfowl hunting.

When beavers construct a dam they produce some valuable waterfowl habitat. In this day of massive drainage and clearance projects, beaver ponds perform a valuable function for both local and migratory waterfowl. If these ponds are spared by "development," fowl will use them extensively in their daily activities and this can provide exceptional sport for the knowledgeable hunter.

Aerial photographs, U. S. Geologic Survey maps and your district wildlife biologist can assist in determining if beavers are in your areas and where such ponds are located. Once the ponds are pinpointed and permission has been obtained to hunt in them, field trips are necessary to determine exactly where and how the fowl are using the pond. Simple knowledge of a pond's existence doesn't guarantee success. Many reconnaissance trips and a lot of hard work, both in the field and at home, are often necessary before a shot can be fired!

Some knowledge of the ducks' habits will make the pre-season reconnaissance more meaningful. Most astute waterfowlers are aware that puddle ducks such as mallards, wood ducks and black ducks are more active during early mornings and late evenings than at any other time of day. This observation is important since these species are the predominate type of fowl using beaver ponds. When scouting before the season, say in late October or early November, the hunter should position himself so he can observe the pond during these critical hours. By doing so he can get a pretty good idea of the number and type fowl using the pond, their arrival and departure time and routes to and from the pond and where they are feeding and resting in the pond. Careful recording of these observations can be very meaningful during the season as many unknowing hunters spend unproductive hours waiting for fowl that may never materialize.

Once the bird's habits have been observed and documented, or at least remembered, the next step is to decide how to hunt them. Two methods are worthy of effort.

Pass shooting, that is, shooting at fowl as they depart from or return to a beaver pond is perhaps the most popular type of beaver pond duck hunting. Its popularity stems in part from the minimum equipment required. In order to be successful the pass shooter must refer to the routes the birds are using and the time of day they are using them. He then positions himself along these routes at the appropriate time and tries his shooting skill.

In this type hunting, decoys and blinds are not needed as the hunter isn't trying to lure the ducks but simply "get a shot" as they fly past. Drab colored clothing, chest waders and some object to break up the hunter's outline, such as a tree or stump and the ability to remain motionless until the ducks are in range are all that's needed in pass shooting. A light, quick-pointing gun with open choke and small shot is also helpful; frequently the ducks seem to materialize and then disappear before a heavier typical duck gun can be brought into action. Since the ducks will usually be at close range and the shot is often through trees and branches the small shot performs better.

While pass shooting requires the least specialized equipment it is none the less quite challenging. Since variables such as temperature, wind, precipitation, food avail-

This is typical beaver pond waterfowl habitat. The author has taken many ducks by sitting motionless on the stump in the foreground.

The author's retriever brings in a drake mallard to be added to bag at right. A good dog helps eliminate "lost" birds in the timber.

ability and hunting pressure can alter flight routes the hunter will be constantly moving his position or modifying his technique to meet the day-to-day changes.

One caution is in order for the pass shooter. As the season progresses, the evening flight returning to the beaver pond becomes later and later. Because of this many a hunter has been confronted with the decision of shooting after legal hunting hours. This decision, however, should not be difficult when the hunter is aware that shooting "after hours" is: (1) illegal and makes the hunter subject to fine and, (2) disrupts the fowl so badly that they may change their flight patterns drastically and even stop using the pond altogether. Ducks will not long tolerate being shot at when trying to roost for the night and the real sportsman will never engage in this activity. By limiting his shooting to the early morning departure flight, the pass shooter won't frighten the birds so badly and can extend his sport.

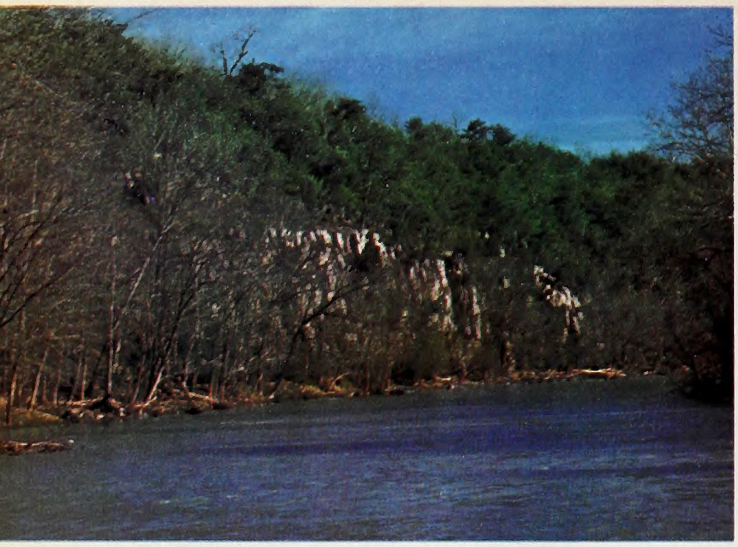
The other type duck hunting available for beaver pond hunters is traditional decoy shooting. In this hunting, the nimrod must also spend considerable time observing the birds' habits in the pond and determining the ducks favorite resting and feeding areas. While most conventional decoy shooting necessitates a blind, beaver pond shooting doesn't necessarily, and in fact the author has had good success without them. Here's why. Beaver ponds are remarkably similar in appearance. By that I mean they all have both standing and dead timber and many blow downs. An unnatural obtrusion, a duck blind, is very visible and usually alerts the ducks more than it hides the hunter. A stump or tree on a dry hummock will break the hunter's outline and will eliminate the need for the very visible blind . . . that is if you can sit or stand still!

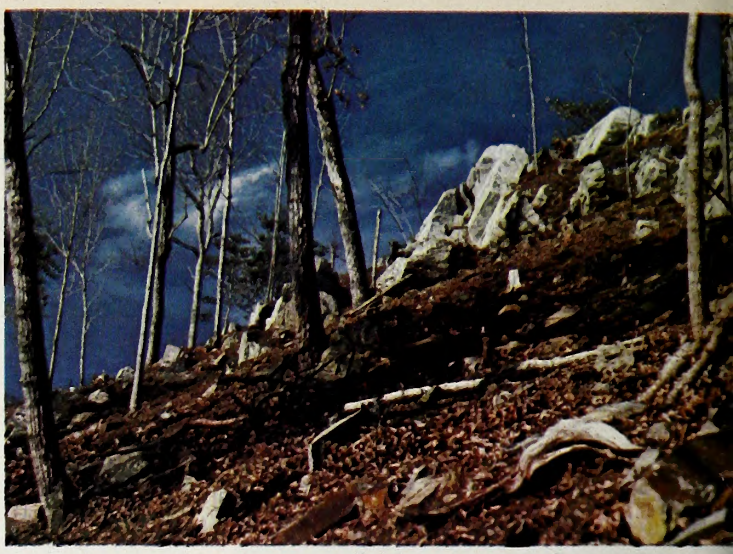
In decoy shooting in beaver ponds the ability to remain absolutely motionless is one key to successful shooting. If you can control the impulse to grab your gun or even move your head to follow circling fowl, you'll have better results. I cannot emphasize enough that a cardinal rule for the decoy user to remember is to remain motionless until the fowl are well within shooting range. The decoying ducks just won't stand for unnatural movement in a tranquil beaver pond environment! If you can't sit still, perhaps a blind is the lesser of the evils but make all attempts to sit motionless before building a blind.

The only equipment the decoy using hunter needs that the pass shooter doesn't is obviously decoys. Since most beaver ponds are small, from six to a dozen are usually adequate as too many decoys tends to make the pond appear overcrowded and gives the ducks few places to land. Standard size or magnum-size decoys both seem to work equally well. A duck call, in the hands of an expert is often beneficial, but a novice will succeed in only alarming and frightening the fowl. If you're no expert, leave your call at home! Again a short barrelled, easily pointed, open-choked gun with small shot will get good resuts.

One last word of advice in beaver pond duck hunting. A retriever will greatly increase your bag of birds. By nature, beaver ponds have many obstructions, both above and below water and it makes human movement in them down right difficult. A wing-tipped duck that glides to the far end of a pond may never be found by a hunter with no dog but a good retriever will pick him up with little effort!

If you have beavers in your area, if you're willing to do the necessary homework and legwork you may find this specialized form of duck hunting a producer for you. Indeed, if you go about beaver pond ducking in a logical and applied fashion, I'll wager you'll put plenty of ducks in your freezer before the season ends. ⬍





MORGAN'S BLUFF

A Desert Beside Rocky River

by Ruth Moose
Albemarle

The Bluffs (left and above) appear amidst the winter-bare trees. Ancient cedars (below, left) stand near the top of the Bluffs. Interesting plants in the area include the rare Wright's Cliff Break Fern.

PHOTOS BY JIM MATTHEWS

THE first thing you hear is the river, a smooth hum in the distance. A mourning dove deep in the woods. All around are plowed fields, pastures, a fringe of trees. This is the highest point of the 15 acres that comprise Morgan's Bluff, North Carolina's newest nature preserve.

From the open field you walk down a dirt road heavily flanked by blackberry briars. On a new post is a fresh sign stating this area has been declared a Nature Preserve.

The dirt road ends in a rutted path, damp from rain, water still standing in deep crevices. Only when you stand waist high in a reedy flood plain, do you finally see the sound you have followed . . . Rocky River. It is mud colored, high and fast. It smells clean, fresh, fishy.

"It's getting better," Dr. Jim Matthews says. "I used to come out here and see it every color of red there is . . . from pink to wine to burgundy. And the smell was sewer. But it's much, much better lately." Matthews is a biology professor at UNC-Charlotte and foremost promoter and protector of Morgan's Bluff. Morgan's Bluff is off Highway #200, below Oakboro in Stanly County. It was discovered a few years ago by Tom Hatley, a Davidson College student, on a Christmas vacation visit to his grandparents. He got the Biology Departments at Davidson and UNCC interested in the area which has been nominated as a National Landmark because of its unusual character.

I follow Jim Matthews through reeds he says are relatives of the sea oat and my first question is, "when will paths be cut in Morgan's Bluff?"

"Never," says Matthews, "or at least I hope not." He almost swims this sea of green reeds. "Cutting paths is one of the things you don't do in a natural

A wide variety of wild flowers grow in patches of soil in rock crevices. Yucca and other cacti do well in dry portions.

area. Natural areas should remain the way nature made them . . . as natural as possible." He indicates a wooded vale where in March was a carpet of wildflowers, including a Carolina anemone that has only been located in five counties in North Carolina. Earlier he had pointed out two trees that the biology department had been excited about; a chalk maple and hop hornbeam. "It's not that the trees in themselves are so unusual, you just don't ever find them growing this close together."

In a cleared area on the riverbank are the remains of a campfire, including rusty rings of wire that had been a batch of old tires. Someone had dumped them here and set fire to them. "A man up the river spotted the fire, came down with his kids and they put it out, then called me. That was back during the dry season," says Matthews. "And things like that scare me. But thank goodness for people who care."

The reeds are broken in patches now by square plates of slate. The river is only inches away in some places as we pick our way around rocks, past craggy cedars. "We expect some of those cedars to be about 200 or 250 years old," says Jim, "but we won't know for sure until we do core borings."

Core borings and study are some of the things you do with natural areas. UNCC will have a graduate biology student working full time in Morgan's Bluff by the time you read this. "We can't wait to see what will turn up after some more careful looking," Matthews says and shades his eyes, looking almost straight up. I stretch my neck and see the top of the bluffs. We are between a slate wall about 100 feet high and the river. The bluffs look like something from a western movie. They are sharp, jagged, almost chiseled in places.

"Morgan's Bluff is essentially a desert. The river makes a sharp bend, gets western exposure, full afternoon sun and that makes the area hot, dry, the soil thin. Also, the sheer height of it makes for a habitation for plants we don't usually find in this area."

One of the most important finds in Morgan's Bluff has been a proliferation of Wright's Cliff Break Fern, a species that is native to western states. Morgan's Bluff and one other spot in North Carolina are the only places east of Oklahoma that Wright's Cliff Break has been discovered. "And the amount of it growing here is outstanding," says Matthews. Missouri Rockcress has also been found in the crevises, the only locality so far in North Carolina. Yucca grows on a slate ledge, a cactus blooms. There are pockets of ebony spleenwort and hairy lip fern. And many, many craggy cedars, twisted into angled shapes.

The cliffs of Morgan's Bluff are easy to climb in many places with ledges almost like stairsteps. Other ledges are a sharp drop or protusion into the river.

The area will not be fenced or roped off or marked into nature trails, according to Matthews. "Natural areas are for people who are interested in nature for nature's sake. Those people will find what they are looking for here." He adds that if people expect to find swing sets, picnic tables and grills, they'll be disappointed. "Natural areas are not parks," he emphasizes.

The land adjoining Morgan's Bluff is being developed by the owner into a campground for tents and trailers, a camp store, boat ramps . . . the works. A bulldozer snorts through the woods. Trees crash like a row of dominos, lay jumbled as pick-up-sticks. The rutted road to Morgan's Bluff separates the land under development and the land to remain as alive and lovely as it is.

"When you run across areas that are unusual like Morgan's Bluff, people say we've got to do something to save them. But most of the time nothing is done and the bulldozers come and we lose another one." In March, Matthews, working with Dr. Tom Daggy of Davidson College, began a campaign to raise the $14,000 necessary to buy Morgan's Bluff. "The first $8,000 came fast," he says, "we got donations of all kinds with things like a $15 check from a garden club, to $50 from a political candidate to $2,500 from industry. It's the other $6,000 that is due and has us in a sweat."

Morgan's Bluff is the first natural area in North Carolina to be saved through individual effort and cooperation between a private and public institution. "None of us had ever gotten involved in something like this before, but we knew if we didn't go out on a limb and do it, our children and grandchildren might never have a chance to see some of these plants except in books."

If you would like to have a part in the preservation of Morgan's Bluff, send donations to Dr. Jim Matthews, UNCC, Biology Dept., Charlotte, N.C. 28213 or Dr. Tom Daggy, Davidson College, Davidson N.C. 28036. ⬍⬍

Remnants of Wildlife Of The Past

by Edward S. Slagle
Greenville
Photographs by Richard C. Capps

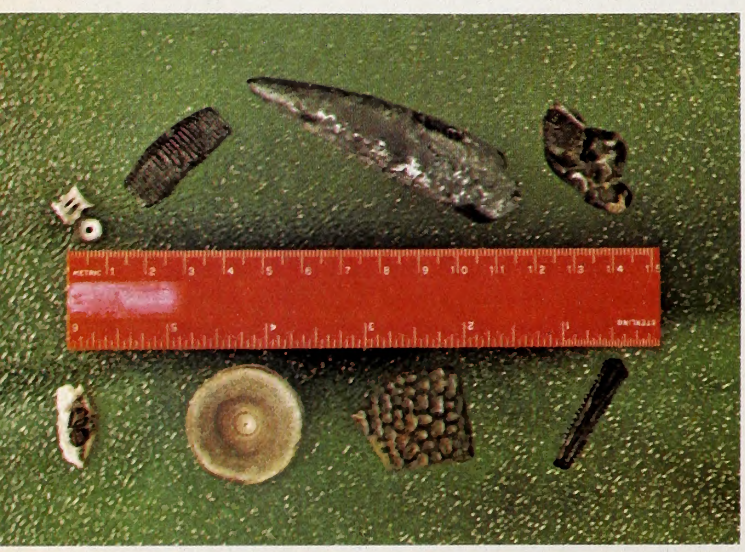
TARHEELS often talk with justifiable pride about the abundance and diversity of wildlife in our State. But long before Joseph Hewes, William Hooper and John Penn took up a quill to represent North Carolinians 200 years ago on the occasion of the signing of the Declaration of Independence, the region we now call North Carolina had had throughout its long and varied existence, a parade of plants and animals so abundant and so diverse in its total assemblage as to make the present wildlife here seem sparse and colorless by comparison.

Evidence gathered from studying the radiation, fossils, structures and other features found in the rocks and sediments throughout the State suggests that at various times in the span of over a billion years this region has been alternately covered and exposed by advancing and retreating oceans. During at least the latter part of that time forms of life have been living and dying, their remains being buried by layers of sediment that have been accumulating and slowly turning to rock. Records of these beings were sometimes preserved as fossils; and although many of these fossils have been lost through erosion, weathering, and other rock changes, enough remains still exist to enable us to tell a great deal about the history of these wild creatures from our past.

Fossils are simply evidences of life in our prehistoric past. Such evidences can take many forms, but are often impressions of shells that were buried as the rock was slowly forming beneath the ocean, or are hard parts (shells, bones or teeth) of ancient creatures. Generally the original material of which the hard parts were made has been replaced by other minerals during the changes the fossils underwent throughout time. Because conditions for preservation are more favorable in the ocean, most fossils are evidences of marine forms of life rather than land forms.

The Coastal Plain gives us the most complete story of our wildlife heritage. It is in that region that several layers (the large ones are called "formations" by geologists) of rock or sediments have yielded abundant evidence of life of long ago. Evidence of life of even greater age is to be found in some parts of the Piedmont and the Appalachian regions of the State, although most of the fossil remains there have long since been destroyed by heat and pressure accompanying the buckling and bending of the rocks when the mountains and their foothills were formed.

Imagine, if you can, the incredible span of time during which life has existed in the region we now call North Carolina. Fossils and other types of evidence in the Coastal Plain suggest that the seas invaded that area of our State several times in the past 90 million years. Of the deposits of sediment (some of which have since turned to stone) that the invading seas left behind, the most conspicuous are called: the Yorktown Formation, deposited during the Pliocene Epoch roughly a half-dozen million years ago; the Castle Hayne Formation, which is of Eocene Epoch age (about 50 million years old); and the Black Creek and Peedee Formations, formed in the Cretaceous Period, about 90 million years ago. In the Piedmont,



These are common Yorktown Formation fossils from North Carolina. Clockwise, beginning upper left: two fish vertebrae, ray tooth fragment, sperm whale tooth, porpoise auditory bone, sting ray barb, soft shelled turtle shell fragment, shark vertebra, parrot fish grinding plate.

These are assorted fossil shark teeth from Pitt and Beaufort counties, N.C. They are shown just slightly smaller than life-size and illustrate a sample of the variety of shapes among small sizes of fossil teeth found in Coastal Plain sediments. Once located, many are often found in the same area.

ACKNOWLEDGMENTS:

Among those who have been helpful in the preparation of this article the author would especially like to thank Miss Sue Ellen Williamson, Miss Patrice E. Benge, Mr. and Mrs. S. Franklin Burney, Mr. M. B. Nicholson, Mr. Bob Purdy, and Mr. and Mrs. R. C. Capps. Any errors which may be present in this work, however, are entirely the responsibility of the author.

the Deep River and Dan River Basin, have yielded fossils of plants which grew in Triassic Period time, some 200 million years ago. Even older fossils from ancient ocean floors are found rarely in North Carolina mountains.

Probably the most important and oldest fossils ever found in North Carolina, however, are those of scaly marine worms called *Vermiforma antiqua* Cloud. Discovered north of Durham in 1974 by geologists from the Virginia Polytechnic Institute and State University, they were found to have lived on the bottom of a volcanic sea around 620 million years ago, making them the oldest well-dated fossils of multi-celled animals ever discovered in North America.

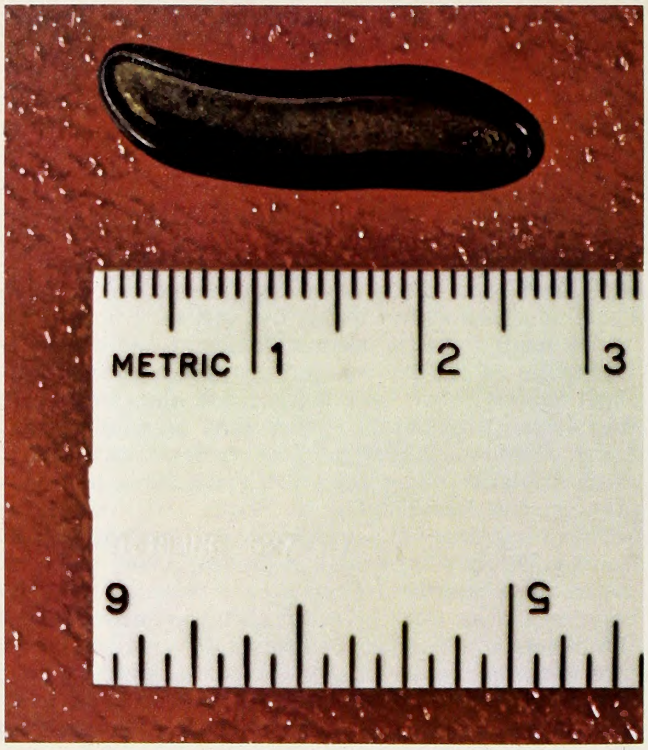
In between the periods of encroachment by the sea, land plants and animals abounded. Elephant-like mastodons roamed the region that is now the Old North State, leaving their tusks to be found a million years later by inquisitive humans. A very few footprints of Triassic Period dinosaurs have been discovered within the boundaries of North Carolina near the Virginia line. Bones and teeth of ancient horses, giant beavers, and even camels have been collected, the camels having survived here for a time after wandering across the Asia-Alaska land bridge. Amber (which is petrified resin) and petrified driftwood have been found in the sands and clays of the Yorktown Formation; large petrified logs have been taken from a gravel quarry in Cape Fear River basin and fern fossils are sometimes discovered in the red Triassic Period rocks and clays of the Deep River Basin, notably near Gulf, N. C.

For the average amateur collector, however, fossil teeth from ancient sharks probably hold the greatest fascination. Such teeth have been uncovered in many counties in the Coastal Plain at quarries or other excavation sites, or where the overlying sediments have eroded away. Most prized of all are teeth from a Pliocene Epoch monster called *Carcharodon megalodon* Agassiz, a close relative to the modern Great White Shark. It is estimated that the largest of these awesome, now-extinct predatory fish grew in lengths of 13 meters (about 43 feet) or more. Large *Carcharodon megalodon* teeth have been found to measure about 12 centimeters (almost five inches) from the tip of the tooth through the middle to the top center of the tooth root. Relatives of our present-day Mako, Tiger, Ground, and Sand sharks were also common in the waters that once covered what is now Eastern North Carolina. Although teeth from these fish are generally large, many other fish teeth found as fossils are only a few millimeters in length.

Shark teeth can be found in several geologic formations in North Carolina, but are especially common in the gray Yorktown Formation sediments, not only because sharks were common then, but also because this formation is relatively young by geologic standards and has not undergone so many destructive events as have older formations. Such fossil teeth generally retain their original enamel, although their bony tooth roots have usually been replaced by such sedimentary material as dark-colored phosphate or lighter-colored carbonates. Color or condition, however, are not reliable indicators of the age of a fossil.

Fossil-collecting can be an absorbing hobby for North Carolinians of practically any age, so long as the proper preparations are made and the proper precautions are taken. River banks are often good collecting sites in the Coastal Plain for it is there that the overlying layers of sand have been most deeply eroded into, often leaving the deeper fossil-bearing formations exposed. Sometimes the bluffs overlooking bays or inlets contain such remains of ancient marine life as fossil shells, whale and porpoise ribs and vertebrae, and shark teeth. Excavations for irrigation ditches sometimes reveal fossils. Or, if your taste runs to smaller things, pick up a handful of clay: with proper

These are examples of petrified logs that occur at several locations in eastern North Carolina. Individual wood textures and tree rings can sometimes be distinguished as in the specimen shown here.



A tiny mouth plate from Pycnodus carolinensis **is shown here (above) about twice its actual size. This extinct fish was named in honor of the State in 1858 by Ebenezer Emmons, first official State Geologist of North Carolina. At right are fossil shark teeth from Coastal Plain North Carolina. The large tooth in the center,** Carcharodon megaldon **Agassiz, measures almost four inches up the middle.**

preparation many Coastal Plain sediments reveal marine shells called "microfossils" which are so tiny that 25 or so of them can fit on the head of a pin.

Wherever one collects, one should always follow certain rules. Always get prior permission from the owner of the property on which you plan to collect. Respect that property; for vandals have ruined or forced off-limits many an excellent collecting site. And don't forget to take along a hat or other type of sunshade, a supply of water, a collecting bag or bucket, and perhaps a picnic lunch. If you plan to hunt for fossils in rocks, a geologist's pick or a hammer and chisel might come in handy. It's always best, too, to place some kind of label with the fossils to show exactly where they were found, as an aid to their identification and classification and in case you or a fellow collector might want to visit the spot later.

If you find a good fossil location or an unusual fossil, why not tell the paleontologist (authority on plant and animal fossils) at the geology department of the nearest university about it? You will be helping to solve the often-puzzling story of the history of this region if you do; and you just might get some free identifications of your fossils in the bargain. ⬍⬍

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

Ducks Unlimited Banquets

Many local chapters of Ducks Unlimited will hold their fund-raising dinners in November and December. Watch for time and place in your area; support this organization.

Wildlife Art Exhibit

Check page 26 of this issue for details on the Annual Wildlife Art Exhibit sponsored by the Wake County Wildlife Club to be held December 2, 3, and 4 in Raleigh.

All Board!!

You may have a few more days to take the "Passenger Ferry" from the eastern end of Harkers Island (Cape Lookout Motel) to Cape Lookout. For details of this exciting trip, call Capt. Josiah W. Bailey, Morehead City, 726-5458.

Hunting Seasons

Several hunting seasons are ushered in during November. For a copy of the current Hunting and Trapping Regulations Digest, contact your nearest hunting and fishing license dealer.

Christmas Presents?

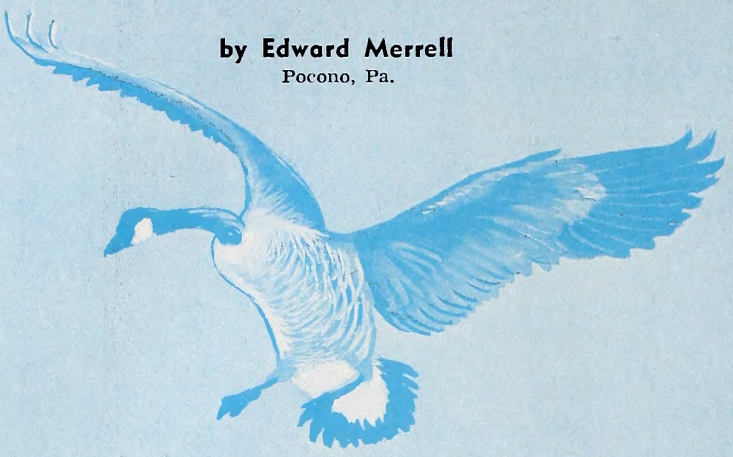
We hope that you'll consider gift subscriptions to this magazine for your Christmas giving this year. You'll find a convenient order form inserted in this issue.

Steel Shot for Waterfowl

Waterfowl hunters are reminded to check the current hunting regulations for steel shot rules in Currituck County. The provisions are for waterfowl only and do not apply to upland game.

GOOSE FEVER

by Edward Merrell
Pocono, Pa.



I shot a goose last season: a big Canada that came honking in full voice to the canvas-covered decoys of my cousin's rig in Currituck Sound. It was the first goose I'd shot, or been close enough to shoot at, in more than 12 years. He came in at a left-to-right cross about 30 yards out with his wings set and his landing gear lowered. I swung my new automatic past him and pulled —nothing. I'd forgotten to release the safety. My heart had been pumping like an overworked steam turbine since that flight of four geese, of which he was a member, had been sighted. My brain (which in an average hunter doesn't need to work to remember to push off a safety) wasn't working at all; remember that 12 years had elapsed since I'd last been presented with this opportunity.

Anyway, that goose was kind—awfully kind—to me. He splashed down just outside those decoys just as if they were members of his own family and by the time he'd detected his error, it turned out to be a fatal one. It gave me time to fumble around for the safety, point, and fire a load of high-power sixes in his direction just as he was beginning to realize he was in questionable company and began beating a hasty retreat. Later while reloading, I discovered that I'd been even luckier than I'd thought. There had been only one shell in my gun left over from an earlier session of coot swatting and finishing off the cripples. Still another instance of the old brain not functioning. If I'd missed on that first shot—I don't even like to think about it.

I shot that goose my first day out duck hunting and it gave me the fever like I've never had before—goose fever that is. It's something akin to buck fever and of about equivalent intensity. I've always had it, albeit to a lesser degree. It's in my blood. My grandfather was a market hunter and guide who routinely set out 100 wooden decoys a day during the season, which was a bit longer in those days. He also had a group of live goose "tollers" which were tethered to a wooden platform anchored to the bottom of the sound with metal stakes. His old Parker side-by-side double, now a prized possession of my father, is one of the most beautiful fowling pieces I've ever seen.

This gun by itself gives some indication as to how seriously my grandfather took his sport, because he was not a weathy man and the cost of that gun must have seemed like a fortune to him. It was the first gun I ever shot and in those days, when I was a bit smaller, it packed a pretty good wallop. One of my most vivid memories of duck hunting is that knot which developed on my middle finger firing that gun during duck hunting season.

But to get back to the story, goose fever is in my blood. It's hereditary —a quite common malaise in my family. Two of my uncles still guide sportsmen in Currituck Sound and my father guided in times past. Almost all my cousins are avid duck hunters, as is my brother. We're not all skilled boatmen and decoy riggers, or crack shots, or craftsmen when it comes to blind construction or decoy carving; but we all have one thing in common: we all get a tingle down our spines when we hear that first old gander honking. We all get a gut feeling of anticipation that's hard to put into words when we see a flight of teal or widgeon passing across the sun at dawn. We are all afflicted with the benign disease called goose fever.

And last year I came down with the fever more than in any other year in memory. After that first day's hunt, I came running into the house holding that old gander, blubbering like an idiot, foaming at the mouth, and showing him off to wife, son, mother, father, sister and anyone who cared or didn't care, to see him. That was the only goose I shot during the season. But in these days when most of the geese of the Atlantic Flyway are shortstopped on the Maryland and Virginia refuges, shooting a Canada honker is just as thrilling as taking an eight-point buck. And to me, one a season is sufficient. A honker is just as much a trophy in my opinion and just as hard or harder to get.

The geese that make it as far as North Carolina are not the tame and docile geese that can be hand-fed by tourists on some of the refuges. These are wild geese—wild, wary and smart geese. Just the slightest thing out of the ordinary, the slightest movement, can flare them away just when you think they're coming right to you. I know, I've seen it happen too many times. But that's okay. That's the way it should be. If the challenge were taken away, most of the enjoyment and satisfaction, when you do succeed in luring that old gander into scattergun range, would be taken away.

And this brings me to a precept I've just recently come to realize: most of the pleasure in waterfowling is not in the shooting. There are many aspects of hunting waterfowl that I took for granted in years past. You rise long before daybreak, adding layer upon layer of clothing for warmth in the blind. The boat ride to the blind pelts your face with drops of cold spray that feels like sleet. The first morning flights begin to trade back and forth as you rig the decoys in the pale, pre-dawn light. And there's the companionship with fellow hunters as you wait to mark a flight that's close enough to try to call them in. As the wind picks up, it seems to penetrate to the bone no matter how much clothing you're wearing. And later, you've got to clean your gun, even though you may not have fired a shot. All these

• **continued on page 26**

THE MUSKRAT

PHOTO BY CHRIS MARSH

by Kenneth A. Wilson

HISTORY IN NORTH CAROLINA

In 1584, the first English settlers on Roanoke Island found vast expanses of tidelands teeming with muskrats and other valuable wildlife. Long before white men invaded America, however, the Indian was using the "musquash", as it was called, for clothing and food. Its first commercial appearance as a commodity in world trade occurred about 1640, not in America, but in France and England. Beavers, otters, fishers and martens were the eagerly sought-for peltries in the New World, but as their numbers vanished, the prolific and always obtainable muskrat became popular.

PRESENT RANGE IN THE STATE

The muskrat is common to abundant except coastwise from Pamlico Sound south where it is missing. Two forms occur in the state, the brown muskrat *(Ondatra zibethica)* and the Coastal or Virginia muskrat *(Ondatra zibethica macrodon)*. The latter, most common in the northeast but found as far west as Raleigh, occurs in two color phases usually referred to as "brown" or "red" and "black". The ranges of the two forms overlap.

LIFE HISTORY

Adult female muskrats have about three litters a year with an average of four young per litter. After a gestation period of 28 days to 30 days, the young are born helpless and naked except for small amounts of fur on the back and head. Two day old muskrats are about 4 inches long and weigh almost an ounce. Their eyes open about two weeks after birth. Though still suckling, small amounts of plant foods are taken. After three weeks,

These tiny new-born muskrats are hairless, blind and helpless. It will take two weeks before their eyes open and they will be weaned at about three weeks of age. Most of the young are born during the summer months.

PHOTO BY KEN WILSON

most young are weaned and feeding entirely on solid food. By January the following year, some March born young are as large as their parents and young females are old enough to breed. With the possible exception of November, muskrats breed to some degree over much of the state during every month of the year. However, most of the young are born from April through August.

MANAGEMENT

Weather

Extremes in the weather often cause discomfort and death to muskrats. Flood water at crucial periods drown many young. Periods of drought, when ponds and small streams dry up and marsh water levels recede, cause mass evacuation of muskrat populations to larger bodies of water. At these times muskrats are highly vulnerable to predation. Normally cold winters are not harmful to muskrats, but when shallow water habitat such as ditches, swamps and marshes, freeze solid, entire populations may perish.

Food

Plant food comprises over 99 percent of its year-round diet. High ranking marsh foods consist of three square *(Scirpus)*, cattails *(Typha)*, pickeral weed *(Pontederia cordata)*, blue flag *(Iris)*, sweet flag *(Acorus calamus)*, reed *(Phragmites communis)* and pond lilies *(Castalia)*. In the Currituck Sound marshes, at least 70 percent of the muskrats' year-round diet consists of three square and cattails. The former is best propagated by sod transplantings, the latter by seeds or transplanting.

Inland muskrat populations feed extensively upon cattails, bur reeds *(Sparganium)*, smartweeds *(Polygonum)*, ragweeds *(Ambrosia)* and the stems and leaves of willow *(Salix)*. Numerous grasses and legumes are eaten, especially barnyard grass *(Echinochloa Crusgali)*, blue grass *(Poa)* and sweet clovers *(Melilotus)*. Corn, soybeans, clover and alfalfa are some of the principal farm crops eaten. Recently cutover swamps with year-round water can be made to produce big muskrat yields by maintaining clearings to allow the rapid growth of muskrat foods. Cattails do especially well in swamps. Good stands can be obtained in 2 or 3 years by transplanting or seeding. If cattails and other foods are already present, food supplies can be maintained by reducing competition from woody plants. Ponds and ditches with year-round water can be developed to produce annual muskrat yields by leaving a nearby 6 to 12 foot wide strip of soybeans or 3 or 4 rows of corn. Crops left in this manner will also serve as food patches for bobwhite quail, mourning doves and other wildlife. In some instances, muskrats damage corn and soybeans during the growing season; then, when crops are harvested, they leave the area to be trapped miles away. If left a winter supply of food, muskrats will usually remain, thus giving the farmer a chance to get back what he lost with a good margin of profit.

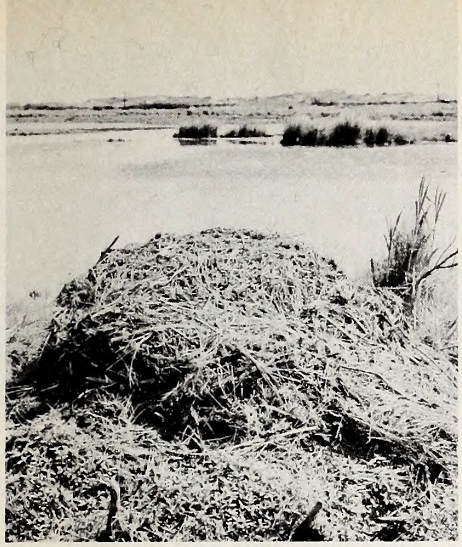
Cover

Though always important, vegetative cover is not a vital environmental factor where muskrats have plenty of deep water and underground plunge holes in which to take refuge. Where these conditions and the cover are missing, however, muskrat populations are usually small. Scattered clumps are preferable to dense unbroken stands of vegetation. The latter condition prevails along the coast, especially from Pamlico Sound southward, in thousands of acres of needlerush *(Juncus roemerianus)*, sawgrass *(Cladium jamaicense)* and cordgrass *(Spartina spp.)*, all of which are excellent muskrat cover but almost worthless for food. Herbicidal applications will retard growth but seldom kill them. Burning or mowing followed by flooding (a minimum of 4 inches of water over stubble) will kill both the needlerush and sawgrass, also giant cordgrass *(Spartina cynosuroides)*. Marsh with peat bottom provides muskrats with another cover medium, that is, a place in which to dig a network of canals and underground tunnels important for safe travel and escape purposes. Marsh with sand bottom, though not so good as peat, is easily dug but caves in readily, while clay bottom marsh when dug remains roiled, a condition muskrats do not seem to like. Marsh with these types of bottoms will support muskrats, provided other habitat requirements are present.

Water

A major factor in successful muskrat management is the presence of a year-round supply of water. Consistently stable water levels in habitat are also important; that is, permanency of the water supply is more important than amount. Marsh, swamp, ditch, pond or stream environments that dry up periodically cannot support maximum muskrat populations. Daily water level fluctuations often produce negative results. Small areas containing year-round water will annually produce more fur, other habitat requirements being equal, than much larger sites holding temporary water.

Where consistent water levels cannot be otherwise maintained, impoundments can be used to hold water at desirable depths, if they do not interfere with farming operations. In tidal marshland, water depths between marsh level and 4 inches over the marsh appear to give the best results. Low ground on some marshes provide these conditions. Where it does not, strategically located wooden dikes built across small guts will give the desired results if other habitat requirements are present. Boards one inch thick and 6 to 10 feet long, depending on peat depth and firmness of marsh are suitable. If the gut is more than 3 feet across, two thicknesses of overlapped diking with braces are necessary. Because of the



PHOTOS BY JACK DERMID

This is typical muskrat habitat: adequate water, plenty of plant food, and some vegetative cover. Mid-winter pelts (right) are considered superior to those taken earlier in the season. Top prices are paid for top quality.

muskrat's burrowing habit, all dikes should have wings (boards driven underground 4 to 8 feet) twenty to 50 feet or more long on either side. Small dikes requiring 300 to 400 board feet of piling can be built — across a 6 foot wide gut with wings 20 feet long — by two men in a day.

Predators

Minks, raccoons, foxes, weasels, domestic cats and dogs, and certain hawks and owls are the principal muskrat predators. Cottonmouth moccasins and snapping turtles might also be included, and, according to some trappers, the otter. Pigs allowed to forage marsh destroy both muskrats and habitat.

Competition

In coastal marshes nutria *(Myocastor coypus)*, a large South American rodent, may compete with muskrats for food and living space. Competition is not usually serious, however, because nutria feed primarily above the waterline and usually do not permanently damage marsh vegetation. Snow geese wintering in the coastal marshes may also compete for available food supplies.

Harvesting the Crop

According to fur dealers' reports, 105,882 muskrats valued at nearly $265,000 were harvested by trappers during the 1974-75 trapping season. No other fur animal is present in such large numbers and none exceeds the muskrat in total dollar value. Of an estimated $1,050,000 worth of fur taken by trappers in the state last trapping season, muskrat peltries made up approximately 25 cents of every dollar.

In many farm pond situations, muskrats construct burrows in the banks and along the dam. The typical 'rat house built of various vegetation including cattails, is shown above. Size of these mounds vary, but most are several feet high.

Muskrats trapped before December 15 over most of the state are unprime and therefore poor merchandise. January and February muskrats are primest; bring the most money. Although state laws make it legal, because of other fur, to trap muskrats over much of the state before December 15, the wise trapper will wait, where possible, until winter before concentrating on this fur.

No. 1 and 1½ steel leghold traps are most commonly used in taking muskrats. Arrange sets so the trapped animal will dive into deep water and drown. Where they cannot be drowned, 110 Conibear and other similar traps should be used. These traps often kill instantly, prevent suffering and loss from "Wring offs", and usually pay for their extra cost in a few nights.

The following suggestions will make the time you spend trapping more profitable: (1) Make a fall survey of the muskrats along the waterways in your neighborhood. (2) Trap only during legal season. (3) Don't trap before fur is prime. (4) Make each set with care, using proper size traps. (5) Tend traps daily.

Pelting and Marketing

If you don't know how to skin a muskrat, ask your local wildlife enforcement officer or some trapper for a demonstration. Well prepared skins are free of loose fat and meat. When the fur is dry, stretch the pelt, fur side in, over a wire stretcher, a shingle, or other similar size board tapered to take the skin. To insure uniform drying and stretching tack down loose ends of skin if a board is used. Don't overstretch. Hang pelt in a cool, dry place away from rats and mice to cure. Cuts in pelts lower the value. The important thing to remember is that clean prime pelts always bring top prices.

If good storage facilities are available, it usually pays to accumulate prime skins and sell in January or February when prices for muskrat are highest. A few reputable out-of-state firms buy fur by mail, but it is believed that trappers can do as well or better with most local buyers.

Some fur buyers will pay as much for an unskinned muskrat as for a well handled pelt. In these cases the value of the carcass offsets the expense and labor of skinning. ◆

North Carolina's Regal Duck

by Ralph E. Mirarchi
and
Thomas A. Pierson

THE late afternoon sun was just beginning to disappear behind the mountains along the New River, adding a fresh crispness to the November air. We were on an island in the middle of the river, working steadily to complete our blind in preparation for the upcoming duck season. A movement above caught our eyes as a flight of eight ducks flew directly overhead, winging straight upriver. They were followed shortly by another flock of five birds, and another flock of seven and another . . .; they kept coming until we had counted well over 200 ducks! The birds all flew in the same direction, never hesitating, as if destined for a common meeting place. The rather large head held high, the short neck and white belly, and the large square dark tail allowed us to identify the passers-by as wood ducks. The woodies, squealers, or summer ducks, as they are sometimes called, apparently were on their way to a favorite roosting site up river. Needless to say, they provided us with a beautiful and unforgettable display and heightened our expectations for the upcoming waterfowl season.

Besides being one of the most ornate and interesting members of the waterfowl family, the wood duck has another important distinction. These beautiful ducks serve as model examples of the conservation ethic, wise use of a renewable natural resource. Before passage of the Migratory Bird Treaty Act between the United States and Canada in 1918, wood ducks were on the verge of extinction. The treaty gave the wood duck complete protection and reduced duck hunting seasons from eight months to about three months. Additionally, law enforcement was upgraded and market hunting became a thing of the past.

By 1941, the wood duck population had rebounded sufficiently to allow limited hunting of the species in 14 states. Although problems such as the clearing of bottomland hardwoods and the drainage of swamps still beset the wood duck, its numbers have stabilized and even increased in some areas within the last decade. During the early 1970s, the average adult wood duck population in the United States numbered approximately 1,400,000 with 160,000 wintering in North North Carolina. This numerical increase over the last 50 years is due to numerous reasons including: 1) the propensity for the hen to renest if the previous nest is destroyed and possibly a second time after a successful nesting; 2) the ability of the species to "pioneer" or spread out into new areas; and 3) proper management of the resource, probably a key factor.

Whether the woodie is hunted with gun or camera makes little difference, for it is a welcome addition to anyone's "bag." The wood duck is the most highly colored and perhaps the most beautiful North American duck. The male has a crested head adorned with hues of regal purple and green with white lines extending from the base of the bill and from the back of the eye to the rear of the crest. The white of the throat sweeps back and upward on both sides of the head. The eyes and the base of the bill are red, completing the head coloration. Traces of black and white separate the burgundy and white chest from the yellow-bronze sides. The deep purple feathers of the back and tail contrast sharply with the white breast and belly.

Though the hen is drab in comparison to the male she is elegant in her own right. White rings surround the eyes and trail behind like colored teardrops on the sooty-gray, crested head. The chest and sides are grayish-brown, flecked with dashes of white while the underparts are pure white.

Many a woodland wanderer in North Carolina has been startled by the loud, squealing "wee-e-eek, wee-e-ek" of the female woodie as she beats a hasty retreat from some hidden woodland stream. The vocalization of the female is often the first indication of the presence of the birds and is very distinctive and easily remembered. The male utters a finch-like "twee-twee," but so softly that he is often thought to be mute. Both sexes have much broader wings in proportion to their bodies than other ducks. This allows them to take off rapidly and dodge tree branches agilely. Wood ducks also ride higher and more buoyantly on the water than most other ducks, giving the distant observer a clue to their identity.

Woodies inhabit wooded swamps, river forests, lake borders, sloughs, and marshes in all the eastern states. In North Carolina they range over the whole state at all seasons, but are much more common in the Piedmont and low coast country. Their numbers are increased substantially by migrants from the north during the fall. During much of the year wood ducks are found in pairs or in groups of four to five, although hundreds may gather at fall and winter roosting sites. Wood ducks, like mallards and black ducks, have more balanced sex ratios than other waterfowl species. Approximately 57 percent of the adults are males, which amounts to one extra male for every four females.

Most woodies breed their first year with pair bonds beginning to

PHOTOS BY THE AUTHORS

The male wood duck is one of our most colorful waterfowl. Even the female (right, above) has delicate shades of gray, buff and some iridescences. The brilliant hues are most pronounced in late winter and spring.

form as early as late October and continuing to form throughout the fall and early winter. Ninety percent of the birds have mates by late February. After pairing, the male follows the female while she searches for a nest site, usually in a wooded area adjacent to water and rarely more than a mile away. After the pair lands on the branches of the tree, the female investigates the prospective nest cavities while the male waits patiently outside.

Females return to the same areas to nest year after year and they may even return to a nesting cavity used previously. The hen prefers a natural cavity with an entrance of 10-20 square inches, a depth of 10 to 20 inches, and an area of 40-50 square inches at the bottom. Cavities 30 feet or more above the ground are preferred over lower ones although nests have been found at heights ranging from 2-65 feet. Tree species of flood plain forests which are important in providing desired cavities are bald cypress, sycamore, silver maple, black ash, black gum, and black willow. In upland areas important species are black oak, red oak, white oak, blackjack oak, bur oak, and basswood. Woodies successfully and readily use properly built man-made wood or metal nest boxes erected on poles or nailed to trees in suitable habitats. It is important, however, that the boxes be made as predator proof as possible.

The nesting chronology of the wood duck differs greatly between southern and northern areas within their breeding range. Nests of northern birds are started later than those of southern birds, and nest initiation spans a longer period in the south as compared to the north. Wood duck eggs are oval, cream-white, unmarked and somewhat glossy, and are about the size of the average chicken egg. Beginning with the sixth or seventh day after the first egg is laid, the hen adds small amounts of down feathers from her breast to the nest everyday until the clutch is completed. Ten to 15 eggs are common clutch sizes although nests with 10-40 eggs are often found. Nests with over 15 eggs are considered to be "dump nests;" that is, two or more females use the same cavity to lay and incubate the eggs, either in shifts or simultaneously. In any case, the eggs are incubated 28 to 31 days. The hen leaves the nest twice daily, early morning and late evening, for approximately one hour each time. The length of time away from the nest varies with the temperature and stages of incubation, being shorter on colder days and during the later stages of incubation. The eggs are covered with down when the hen leaves the cavity. The male, though he never incubates, is attentive to the female and stays with her longer than in most other species of ducks, usually until the eggs are pipped. Often while the hens incubate, the drakes will congregate at communal roosts at night. Of all nests attempted, approximately 50 percent are successful. Nesting failures can usually be attributed to predation or wind damage. Fox squirrels, snakes, birds, and most importantly, raccoons may cause serious losses at times.

After the eggs have hatched, the female broods the young for about 24 hours before she leaves the nest cavity and calls to the young in the nest. Upon hearing the hen's calls, the ducklings spring upward from the cavity floor towards the entrance, gaining successive toeholds until they reach the opening. They may have to jump as much as 60 feet to the land or water below but they are rarely injured. The hen then leads the brood to secluded water areas, as much as a mile away. Broods usually break up after the fifth week.

Wood ducks feed on the land or in shallow water rather than diving beneath the surface to obtain food. As ducklings, they eat almost entirely animal matter for six weeks before switching to a vegetarian diet. They eat pupa and newly-hatched midges, mayfly and dragonfly nymphs, and occasionally even small fish are consumed. The older birds are so partial to acorns that in some areas they are called acorn ducks. Flooded bottomland oak groves are favored feeding areas, although they will enter oak groves on dry land to feed. In addition, the seeds of bald cypress, hickories, button bush, arrow arum, and bur seed together with wild mulberries and grapes are readily consumed.

As hunting and non-consumptive demands continue to increase, proper management plans are necessary to insure adequate supplies of wood ducks for species perpetuation and recreational use. The basic requirements necessary to sustain wood duck populations are: 1) a dependable water supply; 2) the optimal variety and quantity of food and cover; and 3) suitable nest sites. Many of these needs can be satisfied by preserving bottomland hardwood areas and preventing the drainage of swamps and wooded sloughs. In addition, game agencies may temporarily drain beaver

• **continued on page 27**

Native Plants for Wildlife

by Grace S. Draper
Pleasant Garden

PHOTOS BY THE AUTHORS

Identity of native plants even with the "fruit" present is often difficult. Spicebush is shown above and coralberry below. Both attract a wide variety of birds from fall into mid-winter.

NOW is the time to move some native plants from the woods to the yard for special attraction to fruit-eating birds!

Actually, we should choose the plants we wish to move when they are leafed out in the spring and can be easily recognized. This becomes a somewhat difficult task in the winter when we have only bare branches and bark to puzzle over, making identification difficult for even the experts.

So why not plan now to plant *next* winter? In the spring or summer, look for small trees or shrubs in the woods, hedgerows and fields that could be moved to the yard. Choose *small* plants. Mark a chosen plant with vividly-colored string or ribbon for quick identification, then with a spade cut around its root system, approximately a foot or 15 inches from the base. This will enable cut roots to heal before moving, and help insure moving a plant that will survive. In the fall or early winter you can spade it up with a ball of soil, burlapping it, and transferring it to its new location as rapidly as feasible.

Roots should not be allowed to dry out; be sure to tamp soil down well around the roots and water well to also help settle the soil. Often there are very desirable plants being destroyed by new construction and we can preserve them by relocating them on our home grounds. So sometimes we must move such plants at undesirable times. With careful attention to the plant's needs, we *can* make such operations successful. Try to get up as much soil with the plant's roots as possible, and keep it watered well, especially in the hot summer. Usually if a plant makes it through the first year after moving, it will survive. It gives us a certain sense of accomplishment to successfully move plants from the wild!

Native flowering plants are among the most popular to use in the yard. Of course, the all-time favorite is the dogwood *(Cornus florida)*, our state flower, and a plant which grows profusely all over the state, making plants easy to obtain. Following its lovely spring flowering are clusters of bright red berries, a favorite fruit in the fall for many native birds such as the cardinal and bluebird, as well as winter visitors such as cedar waxwings and evening grosbeaks. Estimates from the experts run as high as 99 for the species of birds that feed on dogwood berries. (Squirrels get their share, too!).

Another familiar plant, the native holly *(Ilex opaca)*, an evergreen, also thrives all over the state. It, too, has red berries for birds in the fall. A holly tree can be a lovely outdoor Christmas tree for your yard.

An interesting shrub unfamiliar to many, but one which grows easily in a wet or shady area as well as in most normal growing conditions is the spicebush or wild allspice *(Lindera benzoin)*. Shiny, red berries follow small, tight clusters of bright yellow blossoms in the spring; these berries do not last long, so they must be a favorite summer treat for many of our regulars among the birds. We have seen the catbirds visit these attractive bushes frequently, as well as the mockingbirds and cardinals. The leaves of this wild shrub, when crushed, exude a delightful, lemony odor; a tea may be brewed from them. It is said that the berries

Plants that we often consider as "weeds" provide periodic food sources for birds and small mammals. This is poke berry with its grape-like fruit.

were dried and used in colonial times as a substitute for other spices. The plant's name, *benzoin,* also indicates that it has been used medicinally in ointments and powders for alleviation of pain. As in the holly, some plants are male and some are female, so not all plants will have berries.

Another shrubby plant that grows thickly and easily in poor soil (it spreads rapidly by sending out root runners) and one that is an especial attraction for birds in mid-winter, is the ordinary coralberry *(Symphoricarpus orbiculatus).* The tiny, somewhat insignificant but quite fragrant, flowers appeal to bees in early summer; these are followed by rosy-red berries, thickly clustered on the stems of the little bushes. By mid-January, after continual cold weather and alternate freezing and thawing temperatures, the berries attract small flocks of raspberry-colored purple finches whose plumage perfectly matches the color of the berries.

This plant serves a vital purpose in supplying food for the fruit-eating birds at a time when it is very scarce. In addition, the leftovers are food for birds that scratch on the ground, such as the white-throat sparrows and towhees. We have often watched the many birds flock to clumps of these bushes around the edge of the yard on snowy days, and have been very glad to have this food available for them.

An especially attractive flowering tree, which has small masses of white blossoms quite early in the spring and before other plants flower or even leaf out, is the shadbush, or serviceberry *(Amelanchier canadensis* or *arborea).* This plant belongs to the rose family, and its tiny, purple fruits look like rose hips hanging in clusters here and there on the branches. There are several kinds of shadbushes—some are trees and some are shrubs. Other animals of the forest also like these berries as well as the birds. (This is true of all the berried plants.)

The hackberry *(Celtis occidentalis)* has an attractive growth pattern for a small tree, with crooked, angular branches. It develops oblong, purplish berries that hang singly; the berries are sweet, promoting the name "sugarberry" for the tree. As with the spicebush, these berries seldom hang on the tree very long.

Of course, the wild cherry, or black cherry *(Prunus serotina),* whose fruit ripens in mid-summer, is an especial favorite with the birds, especially the bluebirds and others that are nesting at this time who feed the little cherries to the baby birds. The small fruits have a large seed with a tiny outer layer of slightly bitter flesh, as many of us have discovered when we sample the appetizing-looking cherries on walks through the woods.

The red mulberry *(Morus rubra)* should not be overlooked, as it is an attractive shade tree. It is somewhat unpopular because of its abundance of purplish berries in June and July, so it should be located where these berries do not prove objectionable. Certainly one mulberry tree is worth its weight in gold for attracting the scarlet and summer tanagers, who love its hanging fruits, as well as other birds and small animals.

Another tree that should not be overlooked is the sassafras *(Sassafras albidum)* which offers an outstanding display of reddish-orange foliage in the fall. It also furnishes small, oblong, dark blue berries in late summer for the birds.

The silvery-blue berries of the eastern red cedar *(Juniperus virginiana)* also attract many birds. The cedar waxwing acquired its name from its fondness for these berries. This tree is difficult to move, so look for quite small specimens if you are interested in transplanting one. It will grow in any type of soil. Hedgerows and the edges of fields, where birds have dropped seeds, are good places to look for plants. The tree is an evergreen. It is slow-growing but will eventually attain a height of from 20 to 50 feet. Its dense foliage offers protection for many birds on cold, winter nights, particularly flocks of juncos and white-throat sparrows, as well as cardinals and mockingbirds. In the summer, the cardinal, mockingbird, towhee, and various sparrows are among the birds whose nests may be found in the protective spiny branches of red cedar foliage.

If you will plant a few berried plants in a hedgerow, the birds will aid and abet you in your efforts by planting seeds of other berried plants such as the pokeberry *(Phytolacca americana),* a vigorous herb. The pokeberry is a very important source of food for birds in the fall and winter, probably appealing to as great a number of species as does the dogwood. We leave the pokeberry plants at the edges of the gardens and yard. They have come up voluntarily, year after year, having been planted for us by the birds. To our delight, flocks of migrating robins descend upon the plants, often stripping them completely of their dark blue berries. And there is surely no thrill to compare with the thrill of watching the bluebird families that also come to alight daintily upon the coarse branches and pluck the berries, despite repeated attacks from the mockingbird who may consider the plants to be in his territory!

Other plants which fruit at different times, and which birds will bring to your hedgerow, are elderberry, raspberry, blackberry, fox grape, red sumac, multiflora rose, and even the common honeysuckle, which despite its nuisance tendencies has value as food and cover for birds. An especial bonus: the yellow warbler or the indigo bunting may nest in its protective, tangled vines!

So plan to incorporate some native plants in your landscaping plans which may already include such popular shrubs as firethorn or pyracantha, mahonia, photinia, ligustrum (privet), and aucuba. You will be offering food, protection, and nesting sites—three essentials in attracting birds.

Getting to Know the Green River

by An Painter
Photographs by Sam Thomas
and
An Painter

This three-part series on the Green River continues with Part II . . . a foot slogging, river-running look at the River. In Part I the author described the region and the general aspects of the entire River. Part III will delve into the River's use as a resource.

Here at Fishstop Falls, the River dashes headlong through the last section of the gorge.

● This past Memorial Day I visited the Green for the first time. It had rained torrents for several days, and the clouds cleared just in time for a Sunday morning hike to the Narrows. Sam Thomas had invited some of his friends, one of whom, Mickey Lewis, I already knew, to join us that day.

Both Mickey and Sam have been community leaders in the effort to preserve the Green River and some of its pastoral tradition from the many special interests which threaten the river and the way of life for those who live there. Their work is not appreciated by the community of two dozen landowners in the cove—year-round and summer residents alike.

This is not too hard to understand; people owning land on the shores of the New River in North Carolina's northern mountains hated canoeists on sight not too long ago. But after a while these same property owners came to believe that the only way their river could be kept in the way they knew it and loved it was through its becoming a designated Natural and Scenic River. There have been two studies of the Green for inclusion in the State's Natural and Scenic River list—one published in 1971 and one completed in 1976. Both studies favor the river's inclusion.

The Narrows

It was easy to see why as Sam drove us over the twisting dirt road to reach a trail at the northern side of the gorge. We were very isolated indeed, and after having seen the throngs downstream at the rained-out Saturday races, it was nice to be hiking without the press of humanity. We took an old logging road on foot and gently wound our way around the back of the gorge's steep sides. The woods were still wet and there was severe erosion of the old road. The Green was brown that day.

Perhaps for a mile we followed this road and then a trail sloping 10° or 20° downhill. The forests had been logged, and were primarily mixed hardwood—Canadian hemlock. On the roadside and again within the forest there were wildflowers in a profusion I hadn't before seen in North Carolina. Perhaps it was the rain: phlox, fawn's breath, spider wort, goat's beard, wild rose, evening primrose, monkshood, fire pink, toadflax, daisy, golden alexander, black-eyed susan, coral honeysuckle, beard tongue, goldenrod, aster, butterfly-weed—all on the roadside leading to the Green. Within the forest were trillium, may apple; Mickey pointed out six different ferns. Every now and then there was a hole by the trailside; some gardener finding a cheap way to put hemlocks around the house.

As the trail steepened, we came into thicker clumps of rhododendron and mountain laurel. Because of the rain, fording Pulliam Creek meant I had to get wet. The trail steepened further and ran about 40° for almost a quarter of a mile. Another creek, which has no name except that I think of it as Sam's Creek, meant wetter feet; I don't jump creeks very well. From here the trail drops sharply. We descended almost 200 feet on a 60° slope, dropping a final 300 feet by lowering o u r s e l v e s hand-over-hand straight down. Rugged. Very rugged.

The trail above had run along very soft ground made up of a bit of clay topsoil, pine needles, and the crumbling mica schist rocks. I don't think this area could stand very many visitors, and I am sure the gracious rhododendrons and laurels can't bear too many people hanging on to their branches to drop to the gorge below. The ground under us at the river's edge was solid rock, 500 million year old bedrock, to be exact, and it was

Two intrepids brave Jacob's Ladder — a roller-coaster ride in the middle of the River.

purpley-brown gray, heavily veined with quartz. We scrambled up this rock and the broken-off boulders to get to the Narrows itself. The river's roar increased. So did the poison ivy increase.

In fact, the lushest plant growth anywhere that day was the poison ivy. I am profoundly allergic to poison ivy. It was everywhere—between rocks, parasitizing trees, thick vines like saplings, six-foot high bushes, dwarf rock-clinging forms, everywhere. At one point I either had to plunge into the river or into the ivy (there is no trail). I chose the river and slipped off the rocks, cracking my knees as I went in. On the way back I took the Route of the Ivy. I don't know which I regret more. I had to go to the doctor four times before the allergic reaction got under control. The poison ivy is always in season in the Narrows.

The other thing to see in the Narrows is the point at which the river necks down to 10 or 15 feet wide. The entire river, swollen that day with 12 inches of rain, sluiced through a rock channel which could be jumped. Past river courses had worn rounded holes in the rocks with their hydraulics. We watched one log, on its way to becoming a toothpick, swirl in a hydraulic for an hour. People rarely need get trapped in hydraulics. They are too heavy in the water; it is their floating boats or inner tubes which get caught in these whirlpools, and the people hold on to them instead of letting go.

We had lunch and took a dip in the Green. Cold! The clouds had cleared completely and Sam thought we might be able to do a little canoeing yet that day.

So we climbed back up. It was very tiring, but exciting enough that my muscles didn't start complaining until the next day. We drove back to the rendezvous and Sam dropped our companions. Next —whitewater canoeing!

The Cove

No, I had never done It. I was a novice. Yes, I have gone canoeing. But in case you don't already know it, flatwater canoeing and whitewater canoeing have only one thing in common: balance. Even the canoes are different. That is, they look the same except the inside is different. In a whitewater open boat there is usually a flotation device: a styrofoam piece which takes up one half the interior of the canoe. This should provide a clue for how likely capsizing in whitewater is. But, Sam is a veteran, and once I grasped what "Pry!" and "Draw!" meant, we were ready to teach me about reading the Green River. By the way, rapids are never dangerous; they are thrilling. So too, Jacob's ladder isn't scary; rather it is a good run. Standing waves aren't threatening, they just add a little excitment.

By the time we were back on the road leading through the Cove, the water level had dropped considerably. Also, Duke Power was generating, so we were assured of a swift if less "interesting" passage. All along the road were vehicles of all sizes carrying canoes and deckboats (C1 of C2 classes or kayaks) of every description—fake indian birch bark, trusty aluminum, polyurethane, canvas, fiberglass, homemade, new, beatup, and a lot of people wearing wet-suit tops. This is the sure sign of canoe races.

Another sure sign is Bob Benner. He was here with the third annual races of the Carolina Canoe Club. A two-day event thrown a little out of kilter this year by the unusual rain. We said hello and Bob told us the water had dropped a foot since two o'clock that afternoon, and that so far there had been no incidents. "Canoe incidents?" I asked. No, problems with the folks living in the Cove.

Truthfully, these recreationists were remarkably well slung together that day, considering the area has no potable water for the public, no latrines of any sort, no garbage or refuse bins, no put-in areas; in short, no control or supervision whatsoever: the Green River is the last frontier.

The canoeists weren't the only "recreaters" though. As we made our careful way along the car-lined mudslick road, we were twice overtaken by the same group of motorcycle enthusiasts, who proceeded to roar, literally roar, up a wooded hillside ravine posted "Wildlife Resources Game Lands." Also, we scrunched to the side of the road to let a good-buddy convoy of four-wheel drive, mud-besplattered vehicles rumble by. I wondered where they had been, what they had been up to. Several tents were strung out here and there along the river edge. Again, no regulation. First come, first serve. There were perhaps 50 people that late in the afternoon, 4:30, hanging around the races, testing the water. The two-man canoe races were in progress when we put in, up by the first bridge.

The put-in place was above Cove Creek's entry into the Green. In August I returned to this point, to see Bradley's Falls, which is a fair distance up the creek from the river. Once the canoe was in, the cars moved to likely take-out spots; and with my glasses tied on, we set off. I tried to paddle with my fingers crossed, and I was thinking about "Pry!" "Draw!," and swimming hard. Oh well, resignation. It would be a good way to go. Better than a plane crash. Sam sat in the stern. I am sure now that just about any blunder I might have made he would have been able to correct. After a little practice and some deep breathing, we came to some rapids which were really quite simple. Next were Jacob's Ladder, then a couple of islands. I kept heading for the standing waves, straight down the middle. I reasoned that we'd be very stable because we

Bradley's Falls' twin cascades spray mist over the rocks and trail. The pool formed at the base of the Falls is a favorite swimming hole for the hikers descending the up-ridge trail.

could tell which way the water would come at us. We were stable all right, but we were also very wet. Water inboard in whitewater canoeing is **very** bad. I never did catch on and Sam had us pull over four times to dump the water out.

These little rapids were appetizers. We still had Little Corky and Big Corky (shudder) to go. Well. We made it. And we didn't capsize. And I didn't disgrace myself. We even took an extra trip down to the second bridge to pull out. I pocketed three stones from the Green River for my mementoes. Oh! How my knees hurt.

That night the canoeists had a meeting with the locals. Everyone threatened, then all promised to cooperate, and parted, the showdown put off till another time. I have heard that one landowner has said he may not own the water, but he owns the land underneath, and any canoeist or tuber or fisherman stepping on that land would get a load of buckshot for trespassing. Boy, I'm glad we didn't turn over. In sum, whitewater is a lot more exciting than flatwater canoeing. Not more dangerous, just more "interesting," as they say.

Bradley's Falls

In August the corn had peaked out in the Cove, and yellowed stalks stood in Mose Bradley's field when Sam and I returned to hike to Bradley's Falls. We visited with Mr. Bradley for a bit before going up to the old Bradley place owned by Mrs. Walcott, who lives over in Tryon. Most people visiting the Falls get there by hiking down from route 1153, but we would go up through Mrs. Walcott's land.

The Cove road, when there aren't many visitors around, is the main thoroughfare for only 20 or so people: about ten local homeowners and the summer homeowners from Georgia and South Carolina. This Cove reflects a way of life 200 years old. In the morning the air is still, timeless. Songbirds in the cove and in the woods are abundant. A friend of Sam's has walked the Cove road, listening for birds. On Easter morning this past year, Mrs. Elizabeth Ball heard Louisiana water-thrush, Acadian flycatcher, the black-throated green warbler, all around lake Adger; the towhee, yellow-throat, thrasher and cardinals were near the open fields, and near the second bridge were redstart, white-eyed vireo, Swainson's warbler. At the Lake Adger end were rough-winged swallow, woodpecker, great blue heron, kingfisher, and a sora rail, also pied-billed grebe, green herons and a mallard.

The birds at the Bradley place were noisy, but sort of hidden, since it was raining. During lunch we were entertained by several kinglets among the bushes near the porch. Within the woods on the old logging road which goes part way up the mountain I found what I thought was a wild turkey feather. But later Mose Bradley assured me I had a broad-tailed hawk tail-feather. The game lands, which comprise a tremendous acreage around the Green and its drainage, are managed for turkey and deer. The Wildlife Commission also stocks rainbow and brown trout in these streams. There are wild trout in the mainstream too, but these are not a vigorous fishery because of the incredible siltation coming into the river.

The rain, a solid drizzle, had raised the level of Cove Creek, which had to be crossed. This time I took my boots off and dried on the other side (the first of four times). Sam jumped and got wet. Next time, he took his boots off too. After another hour of walking, we were wet within the rain parkas as well as without. Even the camera had gotten wet. We sloshed along. Many turtles and frogs enjoyed that day, hopping and lumbering with us. In about an hour and a half or two hours, we reached Bradley's Falls.

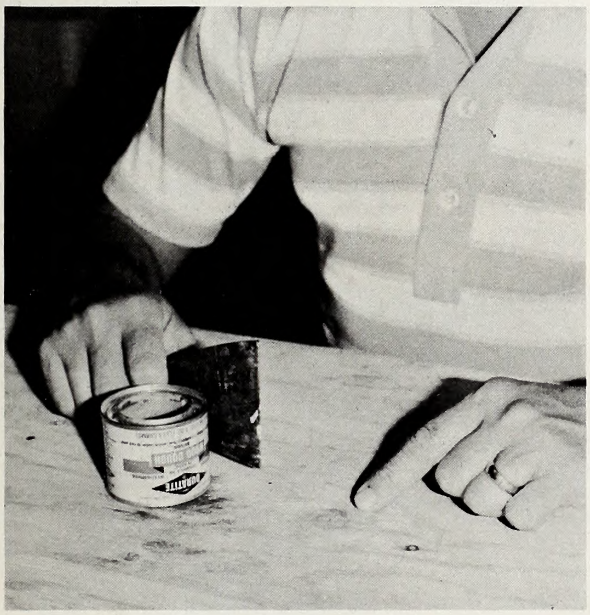
Twin falls descend 60 feet from jagged granite outcrops, one a fine spray, the other a powerful flume, into a pool too dirty that day for swimming. We stayed under an overhang to watch the mist for a while. On the way up we had hiked through woods filled with solomon's seal, cranefly orchids, and impatience or jewel-weed, said to cure poison ivy. The woods and the Falls will belong to NCSU, and the area is included in the State's plan for a Green River Natural and Scenic

• **continued on page 27**

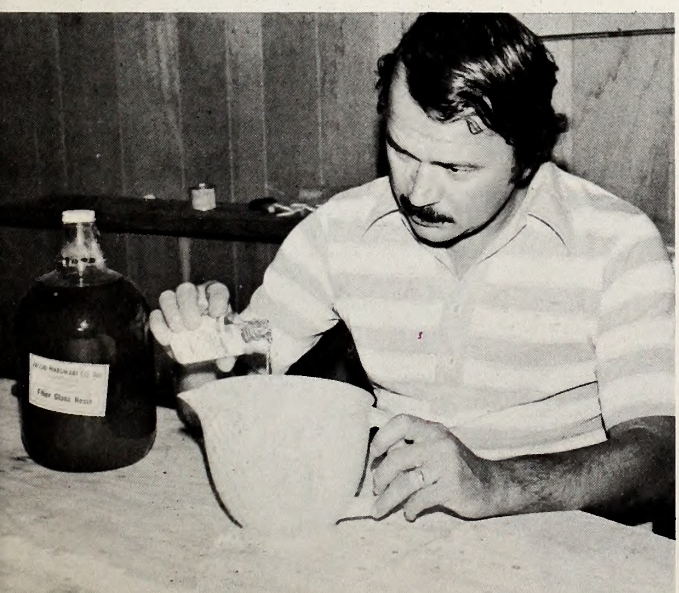
Fun to Fun

BY ED JENKINS

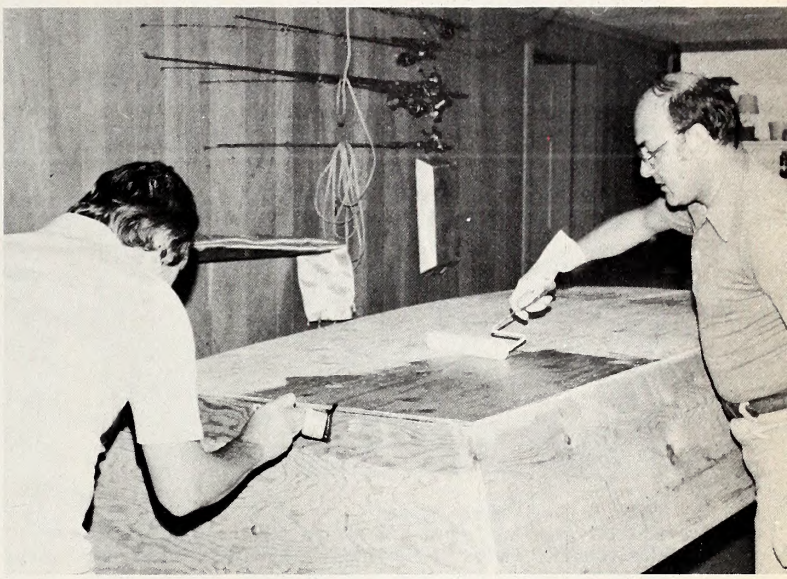
A do-it-yourself waterproof covering of fiberglass can give a wooden boat added strength and protection at a reasonable cost. Here's how.



STEP. 1. Prepare surface to be fiberglassed. Remove all hardware, splash rails and keel for an easier job. Rough-sand surface clean of all paint and varnish. Fill all holes, cracks, etc., with a hard setting putty. Pre-cut the fiberglass cloth allowing two inches to four inches for overlap.

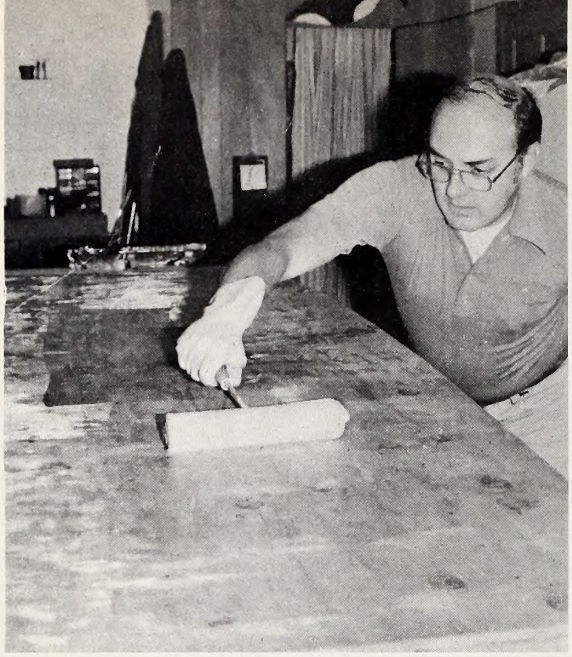


STEP 2. Mix resin and hardener in proper amounts (left). Usually a quart of resin is all you will have time to work with before the resin begins to gel. Plan on working on no more than one half of the boat at a time. Try to work in a well-ventilated garage or covered area with the temperature between 65° and 80°F. If you wish to color the resin, mix the color pigment with the resin before adding the hardener.



STEP 3. Apply first coat of resin with brush and roller (above). The first coat will soak into the wood. Immediately apply a second coat of resin over the first.

STEP 4. Smooth the fibreglass cloth on the wet resin (above). Work out all air bubbles and wrinkles.



STEP 5. Completely saturate the cloth with a third coat of resin and work out all air bubbles and wrinkles (above). Strips of fiberglass cloth (below) can be added to the chine, keel and transom where extra strength is needed.

STEP 7. Allow the resin to set up overnight to cure (above). After the resin has cured, rough areas and overlaps should be sanded smooth.

STEP 8. The final coat of resin should be applied with a 4-inch nylon brush (below) for a smooth finish. If the keel was removed before fiberglassing, replace it while the final coat is still tacky. Allow the resin to cure.

STEP. 6. Repeat the above steps for remaining area to be covered. Overlap fiberglass cloth (below); do not butt joint cloth.

If a coloring agent was not added to the resin, the surface should be covered with a primer and sealer and then painted with a good quality enamel paint. An epoxy paint or anti-fouling bottom paint may be used if desired.

- Letters
- Comments
- This & That

BACK OF THE BOOK

New Executive Director Named

The North Carolina Wildlife Resources Commission in a regular monthly meeting here September 13 named Robert B. Hazel as executive director of the Wildlife Commission replacing Clyde P. Patton effective October 15, 1976.

Hazel joined the Commission in 1950 as a game biologist and later became chief of the Division of Protection (now the Division of Enforcement). In 1969, Hazel was named assistant director in charge of field operations. Patton has served as executive director of the Wildlife Commission since its formation in 1947.

Robert B. Hazel

Eagle Island Game Land Closed Temporarily

The Eagle Island Game Land has been temporarily closed to sportsmen through April, 1977, at the request of the U. S. Army Corps of Engineers. Eagle Island is a 2,000-acre area located on the peninsula between the Cape Fear River and Brunswick River east of Rt. 133 in Brunswick County.

The area is under the North Carolina Wildlife Resources Commission's Game Lands program as part of a cooperative agreement between the Commission and the Corps; however, the Corps has asked that the area be temporarily suspended as a Game Land because of dike work which is underway.

"Unfortunately, our Game Lands Map Book and regulations had already been published by the time we got the request," said a Commission spokesman. "Still, we agree that this work could create a safety hazard, so the Corps has posted no trespassing signs which will be effective this winter."

Free Boat Ramp Opens At Castle Hayne

Fishermen now have a new place to launch their boats with the completion of the N. C. Wildlife Resources Commission's newest boating access area on the Northeast Cape Fear River here.

The new Castle Hayne Access Area is located at the U. S. Highway 117 bridge over the Northeast Cape Fear. In addition to a wide concrete boat ramp, there is also a boarding dock and parking area serviced by a gravel road. Use of the area is free to the boating public. The Wildlife Commission now has 127 free boating access areas across the state.

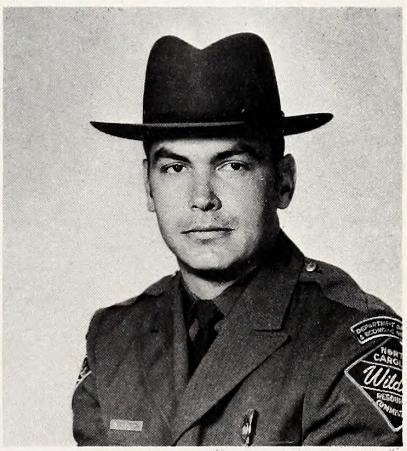
KNOW YOUR ENFORCEMENT OFFICER

Walter A. Hicks, born June 3, 1948 attended South Stokes High School, and graduated in 1965. Mr. Hicks completed the pre-service wildlife training school in 1970 and was employed December 1, 1970 and stationed in Rutherford County. He then transferred to Onslow County in April of 1971, later transferred to Northampton County in October 1971. In February 1974, he was transferred to Iredell County where he is now stationed.

Mr. Hicks attended four in-service training schools at the Institute of Government in Chapel Hill.

He is a member of the N.C. Law Enforcement Officers Asso., State Employees Asso., Southeastern Association of Game and Fish Commissioners, and N.C. Association of the Wildlife Enforcement Officers.

He is married to the former Freya Gay Johnson of King, N.C. They have two children, a daughter, April, age four and a son, Fletcher, age twelve.



Walter A. Hicks

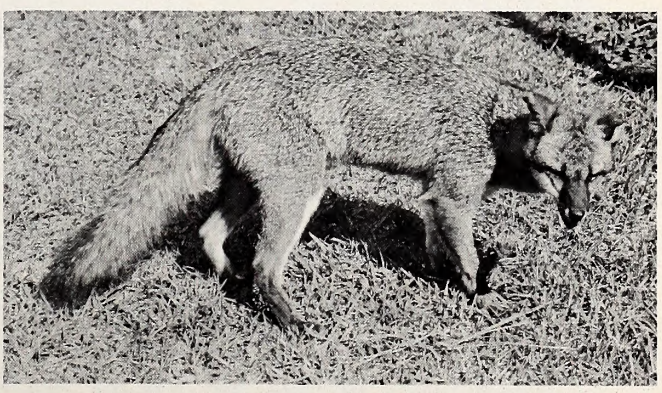
Dumb Like a Fox

Sgt. W. P. Revels has a way with wild animals. It could be his smile or his outlook on life, but probably it has something to do with his liberal feeding sessions.

Whatever the case, the retired Air Force T/Sgt. has a regular daily visitor who strolls up to the back porch of Sgt. Revel's home on 301 near St. Pauls and waits for Sgt. Revel to feed it.

It is a female fox, named Jackie, and she answers to that name. After she eats, she stays around sometimes for three or four hours. If a stranger comes up, she will run away until Revels hollers, "Jackie" and then she'll stop in her tracks.

If he convinces her that the stranger will not harm



Jackie W. P. REVELS PHOTO

her, she will come back to the house. The Sgt. does not have a dog or cat to bother her, so the fox feels at home.

She also comes up on the back porch and eats out of a paper plate. If the door was left open, she would come into the house.

Jackie is a gray fox, and the old Sgt. hopes very much that no one will shoot her, for she is his "pet", and he has been feeding her for more than a year. Her favorite food is white bread. He tamed her by tossing her pieces of white bread which she eats at his feet.

Jackie is about three years old. When she first started coming up to the house, he named her Jack, thinking her to be a male. When she is caring for her young, she comes up three time a day.

According to Sgt. Revels, who has studied wildlife books, foxes build their den near a clearing or in sandy banks, also in canal banks and sawdust piles. There are three to five in each litter born in late spring. Both parents care for the young, and teach them to hunt. By winter, the young are ready to care for themselves.

Vandalism

These photos taken by Timothy Kennedy of Evergreen, N. C. show vandalism of a Wildlife Commission boating access area in the Big Swamp Section of Robeson County. Unfortunately, this is not an isolated situation and occurs frequently over all the State.

Wildlife Art Exhibit Scheduled

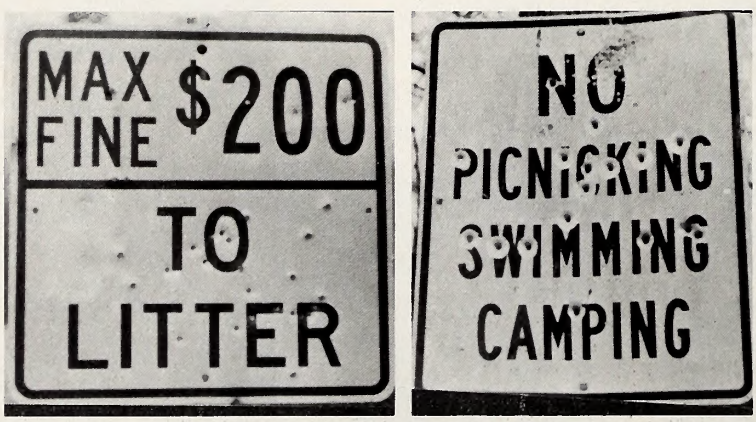
• The world of wildlife art is a fascinating one, and it is a staunch sportsman who can pass up original paintings or vibrant prints that picture his favorite game or depict a familiar hunting or fishing scene. Some of the best wildlife art work in the Southeast is coming to Raleigh December 2, 3 and 4 under the sponsorship of the Wake County Wildlife Club and the Wake County Wildlife Auxiliary.

This annual event has grown in stature since its inception and this year will be open to artists of the southeast region. Invitations have been extended to top wildlife artists from West Virginia to Florida, and the initiation of a Purchase Award program will make the event even more attractive to professional artists. It is an outstandng opportunity for sportsmen and those interested in quality art of the outdoors to view and acquire pieces shown to the public only at this exhibition.

The piece selected by the panel of judges as Best of Show, will be used on a cover of **Wildlife in North Carolina** or as a selected feature in the magazine. (See the cover of the October issue.) Other prize winners will receive handsome engraved plaques.

There are several purposes of this event: to build a memorial and scholarship fund for the North Carolina Wildlife Federation (artists are asked to contribute 20 percent of their sales to this fund). To promote more interest in our wildlife heritage; and, to give artists an outlet to sell works and the public a chance to view and purchase quality art.

The exhibition will be held at the North Hills Shopping Center, Raleigh, December 2, 3, and 4. All interested artists are urged to contact William B. Little, 3317 Landor Rd., Raleigh NC 27609, as soon as possible, for full details and entry blanks.



Most of the damage shown here apparently was the result of "target practice" and certainly did not happen accidentally. The cost of replacing these and others signs over the State runs in the thousands of dollars and the complete destruction of some direction or informational signs could cause inconvenience if not create hazards. Please don't do it.

GOOSE FEVER

• **from page 12**

and other rituals too numerous to list, I have taken for granted or not fully appreciated in the past.

No more! I have had a new birth, a reawakening to the pleasure of waterfowling. I have read everything I can get my hands on about waterfowl hunting, waterfowl behavior, decoy carving and rigging, and shotgun shooting. I have listened to recordings of duck and goose calls and practiced my calls religiously until my wife has threatened to run me from the house. I have purchased navigation maps of duck hunting areas and studied them. I have joined Ducks Unlimited and subscribed to FIELD

AND STREAM and WILDLIFE IN NORTH CAROLINA magazines. I have my father's old rig of decoys and I am restoring and repainting them as if they would all be future mantel pieces. I have ordered and perused mail-order catalogs of hunting equipment and have prepared a wish list of everything I could conceivably need to hunt waterfowl.

And I can't help but think it was that goose coming in with his wings set and his landing gear lowered that triggered a feeling that had been more or less dormant until then. It was that lone goose sitting just outside those decoys that gave me goose fever like I've never had before. ⬍⬍

Wild Turkey Stamp-Print Available

Edgefeld, S.C. — The 10,000 member National Wild Turkey Federation has introduced the first annual wild turkey stamp. According to Executive Vice-President, Tom Rodgers, the program has been designed to closely rival the Federal Duck Stamp in both investment and fund-raising potential. All proceeds will go toward education, restoration and the purchase of wild turkey habitat.

The colorful design selected for the first wild turkey stamp (1976) was donated by noted Florida wildlife artist, Russ Smiley, and features the Florida wild turkey, OSCEOLA. In addition to the limited stamp sale (50,000 printed), a signed and numbered edition of prints (1000 printed) has been produced. With over one million wild turkey hunters in the United States today, the supply of stamps and prints should be exhausted quite rapidly.

The first full-color wild turkey is available for $63 unframed and $110 framed (stamp included). Stamps are $3 each and all donations are fully tax-deductible. Orders should be directed to: Wild Turkey Stamp, P.O. Box 467, Edgefield, S.C. 29824.

REGAL DUCK

• **from page 17**

ponds, plant them with Japanese millet, and allow them to refill. They may also dike over and flood lowland hardwood stands rich in mast ("green tree reservoirs") to produce a palatable food crop. In many areas, nest boxes may be erected in habitat devoid of suitable nesting cavities. By continuing many of these management practices and by encouraging private landowners to do the same, state and federal agencies hope to produce sustained yields of wood ducks for the enjoyment of hunters and non-hunters alike.

As with other ducks, hunting for wood ducks is best in the early morning and just before dark. Sets of mallard decoys and the mallard call seem to work well and draw some into shooting range, although they do not decoy quite like mallards. Jump shooting along creeks and streams and around the edges of wooded ponds is also a favorite method. Often wood ducks are taken incidentally while the hunter is afield primarily for other game. Since these handsome ducks often roost in large flocks they may be taken as they fly to and from a favored roosting site. The next time you happen to add a woodie to the "bag," whether by gun or camera, you can thank the conservationists of the past and present for your trophy. Hopefully through wise use of the resource, future generations of North Carolinians can enjoy this regal member of the waterfowl clan. ⬍⬍

Note: For further reading on the wood duck consult **Ducks, Geese, and Swans of North America** by Frank C. Bellrose.

GREEN RIVER

• **from page 22**

River as a park. I hope that if many people visit Bradley's Falls, they will be more respectful than the slobs who threw glass bottles into the Creek and left their styrofoam ice chests to rot along the trail. Certainly this area, too, is at the edge of a frontier.

Last visit that day was to Fishstop Falls, down the gorge from the Narrows and really the last rapids before the beginning of the Cove. Fishstop is far too violent for crossing, or passing through, even in a barrel. We hiked in from a roadside camping spot occupied by some truck campers. The impromptu clearing was clotted with garbage, and refuse which continued up the trail most of the way to the Falls a quarter of a mile off. It is at these Falls that the Green changes character from a raging boulder-filled white torrent to a swift, sometimes green, recreational river, as again it changes from a rapid-filled thrill-ride to a slow, meandering pastoral river below Lake Adger.

There are so many values to be preserved at the Green, and so many pressures squeezing for change. The River is at the frontier of old and new. So many people want so many different things from the Green that there is going to be a big change soon. There are dozens of directions in which this change could move: historical preservation, expansion and updating of Duke Power's outmoded electrical stations, more thorough timbering, a natural and scenic river, a state park, increased game lands acreage with recreation access points, conservation easements and gifts of land, a pumped storage plant in between Lake Summit and Lake Adger, additional second and vacation homes, recreational communities, concessions, on and on. The next part in this series deals with the Green River as a resource, and its vulnerability. ⬍⬍

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Ted Dossett ..... Writer-Photographer
Curtis Wooten ..... Writer-Photographer

The story of the snow goose in North America is an interesting one (see page 4) and represents a success for scientific game management. Our cover pictures an adult snow goose (lower) and an "immature" bird with its gray feather markings. Both have the characteristic black wing tips. Painting by Duane Raver.

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SNOW GOOSE

STAFF PHOTOS

by Curtis Wooten

THE predawn darkness lay like a shroud over us as we spread our makeshift decoys upwind of the drainage ditch that split the 200-acre field. It was cloudy and cold, spitting snow occasionally, perfect weather for goose hunting. The season on greater snow geese, the first since 1931, had been open for over two weeks and though several thousand birds had been seen the previous day in the winter rye field we were hunting, we were only cautiously optimistic about our chances of success. The moon was nearly in its full phase and the geese had been feeding at night.

Our decoys, a hundred or more white rags propped up by small sticks, white plastic jugs and a few Canada goose silhouettes, were arranged in a ragged circle, making a small white dot on the grey darkness of the field. A flock of pintails, barely visible in the early morning light, whistled overhead as we made our way into the ditch, the only cover available.

We crouched low and waited, the cold of the ankle-deep water chilling our feet despite the layers of thick wool socks under the rubber boots we had pulled on earlier.

A dozen or so birds, in tight formation, materialized treetop high at the field's edge a half mile away. They dropped lower, skimming 30 feet above the tender winter rye. They had obviously spotted our decoys and were bearing down to check them out.

I glanced at my partner. Snows? He raised an eyebrow. Maybe! I clutched my double a little tighter, thumbed the safety and crouched lower in the ditch. The grey of their bodies turned to white as they came closer. Snows? Still not sure! They were almost upon us, their markings becoming visible—no black-wing tips, huge bodies, long necks—whistling swans!

We relaxed a bit as the birds passed directly overhead, the wind whistling through their feathers. They banked sharply over the decoys, checked them out, flared and flew on.

A lone bird appeared half way across the field, bearing down on the decoys. He appeared smaller than the swans, the wingbeats a bit shorter. He bore on, black wingtips becoming visible—snow goose! Again my grip tightened on the old double as I crouched lower in the ditch. At 30 feet out my partner rose and fired, making a clean kill.

After that it was as if someone had opened the gates. Flock after flock, some high, others low, appeared as though swept from the dense clouds by the frigid December wind. They sounded their coming with high pitched calls long before they could be seen. Several flocks responded to our decoys and we soon had our two-bird limits.

The greater snow goose is a magnificent game bird and I will forever be grateful to those early sportsmen who supported regulations that protected the birds when the population was low; sportsmen who financed refuges and provided for protection and research which led to the snow goose population increase that justified a reopening of the hunting season. My first snow goose hunt was an experience that I will not soon forget.

But let's back up a minute. The history of the snow goose since the late 1800's—the decline in the population, the cry of alarm at the low population by sportsmen, the research, management and protection of the population, and their subsequent increase in numbers is a fascinating story which bears retelling.

Little is known about the greater snow goose prior to about 1900. There are references to "thousands of grey and white geese" or "great stories of swans and geese" made by early explorers of North Carolina and the St. Lawrence River Valley of Quebec, Canada; but such references are of little value in evaluating the number of geese that were actually present at that time. From information that is available, it is believed that there was a significant decline of the snow goose population in the late 1800's. The reason for the de-

As various management practices paid off, including restricted hunting, the snow goose population built up to levels where concentrations of birds began to damage their own marsh grasses (right). It is hoped that harvest through hunting will help the situation.

cline has never been fully explained, but several theories have been proposed—and other factors have been ruled out. One factor that automatically comes to mind is hunting, either market or sport, and one would naturally think that this would have been a factor in the decline of the snow goose population. But the evidence does not indicate that to be the case.

Market hunters made serious inroads in some waterfowl populations during the late 1800's and early 1900's but the snow goose was seldom one of their targets. At that time the snow was primarily a marsh feeder and as a result was considered by most to be somewhat less appetizing than other species of waterfowl. Probably for that reason they were never seriously sought by the market hunter. In recent years they have shifted much of their feeding inland, and as a result provide a much more tasty dinner than in previous years.

Sport hunters were never in a position to harm the snow goose population because of inefficient sporting arms and ammunition (compared to today's standards) and the marshes of North Carolina, Virginia, Delaware, Maryland, and New Jersey where the birds wintered were remote and difficult to hunt—as were the mud flats of the St. Lawrence. Other species of waterfowl were more plentiful and sport hunters tended to hunt those most numerous and most pleasing to their palate —the snow goose wasn't among those.

There is no way of determining exactly why the population declined, or to what extent, but recent studies indicate that it was probably due to a natural catastrophe of some type. Most likely it was due to nesting failure for several years in succession—a product of residual snow on the arctic nesting grounds.

Whatever the reason, it was a group of sport hunters at Cap Tourmente, Quebec, Canada, who first voiced concern about the decline in the snow goose population. Cap Tourmente, is in the heart of the St. Lawrence staging area, an assembly point for snows in their annual migration from the arctic to their wintering grounds along the Atlantic Coast. In early October much of the population assembles there until harsh weather forces them farther south. They assemble there again in May awaiting the spring thaw so they can return to their nesting grounds in the arctic.

In 1906, Cap Tourmente hunters reported observing only 3,000 snows using the area, apparently a significant decline although there is no reference to previous numbers. Two years later, in 1908, seven private hunting clubs in the area banded together and leased the Cap Tourmente staging area. They worked as a group to preserve the habitat, realizing that habitat preservation was essential for the return of the snow goose population to their former numbers. They also put strict controls on their own hunting, not because they felt it had been a major factor in the decline of the population, but because they realized that it was the only mortality factor over which they had any control.

The little information available from that period indicates that the snow goose population was actually beginning a slow comeback at that time (the early 1900's). The passage of the Migratory Bird Treaty in 1918 provided for a unified approach to regulating the hunting of the snow goose, as it did other migratory birds and they continued to slowly increase their number. The treaty halted spring hunting of greater snow geese altogether in the U. S. and Canada—although a fall season was still allowed in both countries.

In 1931 all hunting of snow geese was halted in the United States, though Canada continued to hold its fall season. At that time, the population was estimated at around 10,000 birds.

A limited amount of information on population size, from visual observations, was recorded during the 1930's and 1940's, but the figures are not considered to

Snow geese utilize coastal marshes with patches of open water for both feeding and resting. Much of their feeding is done in open fields of grasses and cut-over grain.

The future of the snow goose looks good, but careful checks must be made on their numbers before, during and after the hunting season.

be very reliable. It was not until 1950, with the beginning of aerial *visual counts* by the Bureau of Sports Fisheries and Wildlife (now the U. S. Fish and Wildlife Service), state wildlife agencies and the Canadian Wildlife Service, that reliable information on the total snow goose population became available. Aerial *photocounts* of the wintering population were begun by federal and state agencies in the mid 1950's and have since been picked up by the Canadian and Quebec Wildlife Services on the St. Lawrence staging grounds. The technique has been perfected to the point that practically every snow goose is counted no less than three times during its annual migratory travels down the Atlantic Flyway; once on the St. Lawrence staging area as they assemble there early in their fall migration; again on the wintering grounds of North Carolina, Virginia, Maryland, Delaware and New Jersey by the various state wildlife agencies and the U. S. Fish and Wildlife Service; and again on the St. Lawrence staging area on their trip back to the arctic nesting grounds in May. The fall photocounts provide accurate information on the size and age ratio of the fall migrating population, figures which are double checked by photocounts of the geese on their wintering grounds. The spring photocounts of birds on the St. Lawrence give accurate figures on the number of birds returning to the artic nesting grounds.

The snows have hardly arrived in the arctic when waterfowl biologists show up to evaluate nesting conditions and determine the nesting success of the birds. Information they gather is augmented by satellite telemetry of the nesting region, giving accurate information on nesting conditions across the entire nesting area.

Those biologists have found that the returning snow geese have usually arrived in the arctic by early June; and if weather conditions permit, egg laying has begun by the tenth of June. They have also found that if egg laying is delayed as late as June 21, production of young will be down significantly for that year. This happens fairly regularly, causing sizable fluctuations in the ratio of young to adult birds in the fall migrating population.

Although reports on the size of the snow goose population may have been underestimated, it is obvious that they were never as plentiful as other waterfowl species and it may be that they were never as numerous as they are today. Records indicate that the population slowly increased to and rocked along at from 30,000 to 50,000 birds until the early 1960's. About that time, several successful nesting seasons in a row skyrocketed the population to upwards of 150,000 birds. There were nearly 200,000 birds migrating south annually by the early 1970's and the large population had begun damaging the marshes they were dependent upon for food and shelter. Large "eat outs," areas where marsh grasses had been eaten and the marsh left barren, were appearing throughout the wintering grounds and on the St. Lawrence, a condition which poses a serious threat to the life of the marshes and the continued well being of the snow goose population.

As food in the marshes became scarce and the population maintained its high level, more and more snows began shifting their feeding to the tender winter

• **continued on page 26**

North Carolina Decoys

by Walt Brown, Jr.
Burlington

IN past issues of **Wildlife,** there have appeared articles on both contemporary and antique decoys. The articles were very interesting and informative but the fact has been overlooked that North Carolina not only contributed greatly to the hunting of waterfowl, but also to the development of the decoy.

Currituck and Pamlico sounds have long been famous for the duck and goose hunting to be found here. Due to the number of fowl that wintered there, the decoys used did not have to be of the highest quality. Even though North Carolina decoys are somewhat cruder than those of the north, North Carolina turned out many carvers whose efforts were comparable anywhere. The Saunders, Whitson's and Lewarks of Currituck County turned out admirable decoys that are proudly pampered in collections today.

Yet, here on the sounds of North Carolina there evolved a special type of decoy that has been and is still used most effectively. This type of decoy evolved to meet the need for lightness that became a factor when large numbers of decoys were to be used. The decoy was a wooden and wire frame covered with canvas. A baseboard was cut for the vertical profile of the species to be produced, and a horizontal profile was added and fastened to the base. Wire was then used to form the general shape desired, and horizontal line or twine of some type was used to give the wire frame structural rigidity. The heads were of wood and were fastened to the baseboard. The completed form was then covered with light canvas, drawn tight and tacked around the edges and up the tail. After being shrunk to the frame, the canvas was painted the desired color and was then ready with the addition of the anchor.

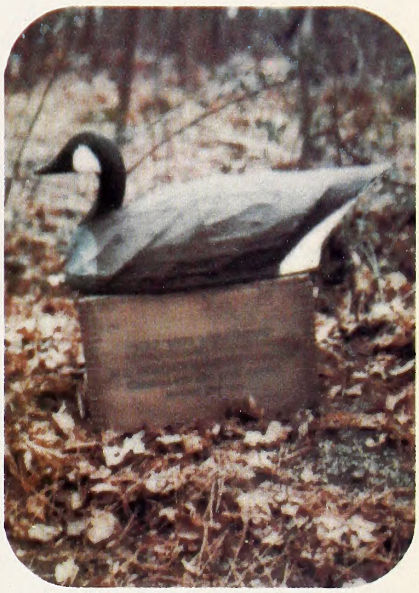
This type of construction is mainly used today in decoys for geese, yet examples exist for ducks although they are not common. The goose pictured is typical of the type and is quite a bit lighter than geese of solid wood. It is of recent manufacture.

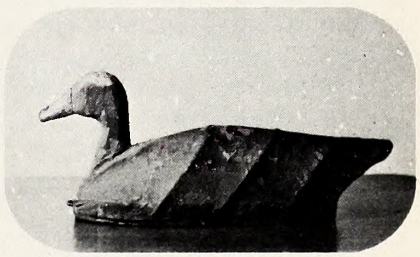
The duck shown is 14 inches long and 5¼ inches wide at its widest point. It is from Currituck Sound and would be at least 35 years old. The head is of pine; however, this specimen is unusual as its bill is an additional piece of wood.

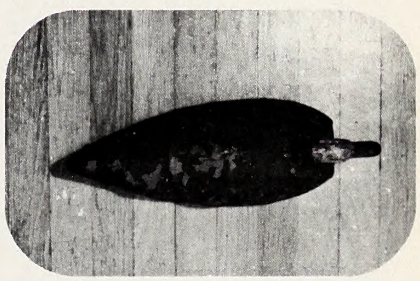
These decoys are light, easy to construct, and serve their purpose admirably although they are somewhat susceptible to rough handling and number four shot is not conducive to their longevity. However, they are easily patched and easily recovered should they deteriorate to that extent.

When compared to the finely carved decoys of the Atlantic Flyway, these blocks appear very crude. However, they are most effective in actual use and when viewed from the angles of ducks and geese, appear very lifelike indeed. Their effectiveness can be attested to by many a Tarheel waterfowler.

These decoys persist in their use on the North Carolina Coast and in this day of plastics and machines it is refreshing to see something constructed from ordinary materials basically by hand that achieves its purpose so well. Let us not forget our native decoys; they have added a great deal to the history and the success of North Carolina waterfowling.







Dressing Big Game

by R. J. Warren, J. A. Wesson, and M. D. Russell
Department of Fisheries and Wildlife Sciences
Virginia Polytechnic Institute and State University
Blacksburg, Virginia

FIGURES 1-7 COURTESY NEBRASKALAND
FIGURES 8-9-10 BY AUTHORS

• Too often the novice hunter is so involved with the excitement of going deer hunting that little though is given to what must be done if a deer is actually killed. The manner in which game is handled from the time it is killed until it is eaten influences greatly how good it will taste. Proper care, handling, and preservation of the venison is vitally important. Failure to do so properly results in the meat waste.

The first thing to do is to go on your hunt prepared. Take a small pack along with you when you go hunting containing at least the following essential items: a sharp knife, about 10-20 feet of strong rope, paper towels, and two plastic bags.

After you have made certain that your deer is dead, you should immediately tag the animal as required by State law. Before you proceed, you should decide whether or not you want the deer's head for a trophy. If not, the animal should be bled. With the head downhill, insert the knife at the point of the brisket (between the forelegs) and cut towards the backbone, thereby severing the arteries and veins leading from the heart. Bleeding helps cool the meat and in addition prevents spoilage since blood deteriorates more rapidly than does meat. If the deer was shot in the chest area, chances are it bled well enough before it died. Some hunters consider it unnecessary to bleed deer. Others think bleeding helps remove some of the "gamey" flavor which some people associate with venison. Some hunters also feel that removal of the musk glands is necessary; others consider it unnecessary. If the musk glands are not removed, care must be taken to not touch these glands with your hands or knife, as this can transfer an unpleasant taste to the meat.

To clean your deer, make an incision in the abdomen, but be very careful to not puncture the intestines or rumen (paunch). This is best accomplished with the knife tip wedged between two fingers as shown in Figure 1. When cutting the hide, cut from the inside. This will avoid cutting hair and will help prevent hair from getting on the meat. Next, cut around the sex organs and anus. The diaphragm should then be cut free from body wall. (Figure 3.) Cut the trachea (windpipe) and esophagus (gullet) near the neck and free the intestines from the pelvic bones located between the hind legs.

FIGURE 1. Wedge the knife tip between two fingers, taking care not to puncture the intestines or rumen.

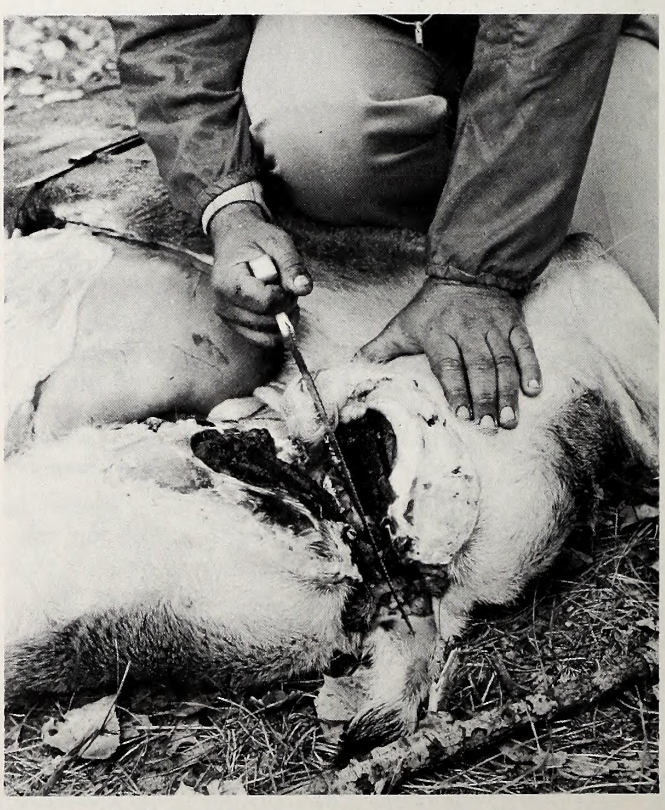


FIGURE 2. If the pelvic bones are opened with a small saw, watch for jagged bone edges; you might cut yourself.

Remove all entrails by pulling them away from the body while severing all attachments along the backbone as the organs are removed (Figure 4). The heart and liver may now be cut free and placed in the plastic bags. Trim all bits of tissue from the body cavity and clean the blood out of the cavity (Figure 5). The paper towels are useful for this and to clean your hands when you are finished. If you prefer, your deer may be cleaned while it is wedged on its back. Some hunters like to bring along an axe or folding saw to open the rib cage and pelvic bones. (Figure 2) However, this splinters the bone and leaves a jagged surface on which you could easily cut yourself, so be careful.

When removing your deer from the woods, for your own safety, wear bright red clothing. Deer are usually carried or dragged in one piece with the hide on to protect the meat. This is where the rope is useful. The heart and liver may be placed in the body cavity while the deer is removed from the woods.

Since the animal's body heat can cause rapid spoilage, your deer should be cooled as quickly as possible. In the field, this is accomplished by propping the chest and abdominal cavities open with clean sticks. (Figure 6) If flies are a problem, the carcass should be covered with cheesecloth to protect the exposed meat. If the deer is to be kept in a hunting camp, it should be hung in a cool place. (Figure 7)

Your deer should be aged by hanging it at refrigerator temperature (35-40°F) for 7-10 days. Older bucks require about 10-14 days, whereas a couple of days are sufficient for very young deer. The aging process helps make the meat tender by allowing enzymes to break down the muscle tissue. Meat will not "age" if frozen, so it must be aged at refrigerator temperature prior to freezing.

To skin your deer, first hang it on a stick or bar which has been inserted through the deer's hind legs. There is a space between the leg and tendon on the leg which is ideally suited for this purpose. Carefully cut the hide near the musk gland, being very careful to not touch the gland, and pull the hide free while cutting the connective tissue very lightly with your knife (Figure 8). Once the legs are skinned free, the hide around the body may be "punched" free by using your fist to force it free (Figure 9). This method easily separates the thin muscles on the deer's side from the hide and makes tanning the hide easier. The hide is then pulled down to the front legs. Split the hide on the front legs and pull the skin free while cutting the connective tissue carefully with your knife. The hide is then pulled down the neck. Cut off the front legs at the joint and remove the head and hide. (Figure 10) Your deer is now ready to be butchered. There are many commercial butchers who will do this for a nominal fee and will wrap your meat in packages ready for the freezer. Again, however, be certain that your deer has been properly aged **before** freezing.

The important thing to remember is that the way you treat your kill in the field influences greatly the quality of the meat. Proper handling and care of your game will pay off in terms of the good meals you will later enjoy. It is the true sportsman and conservationist who utilizes to the fullest the wildlife resources he or she has taken by hunting.

MORE PHOTOS
NEXT PAGE

FIGURE 3. The diaphragm is cut from the body wall. A sharp knife is essential for easier cutting.

FIGURE 4. Sever all attachments along backbone as organs are removed. Heart and liver should be placed in plastic bags for later use.

FIGURE 5. Trim all bits of tissue from the body cavity and clean the blood from the cavity. Paper towels are handy.

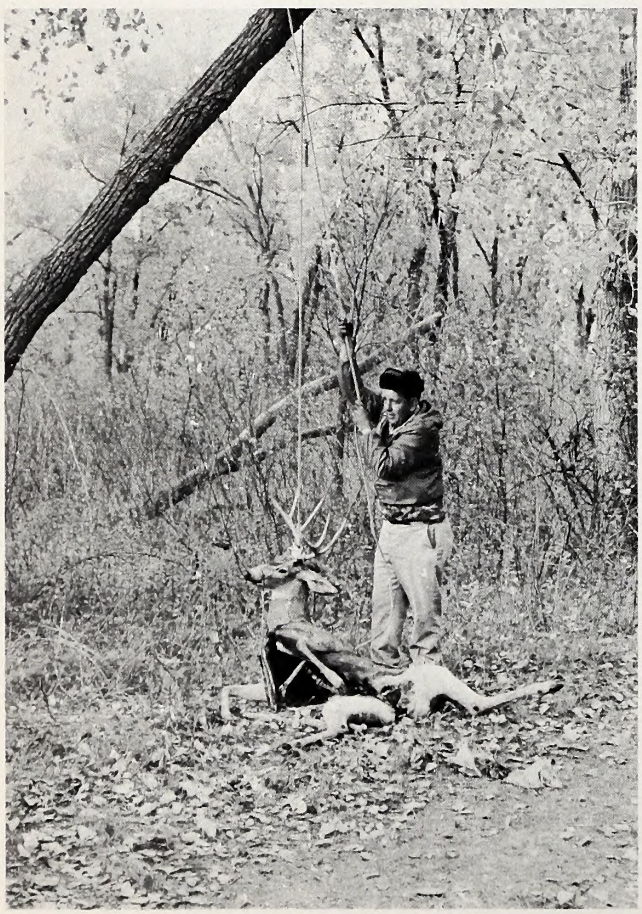


FIGURE 7. The carcass should then be hung in a cool place and protected from flies with cheese cloth if necessary.

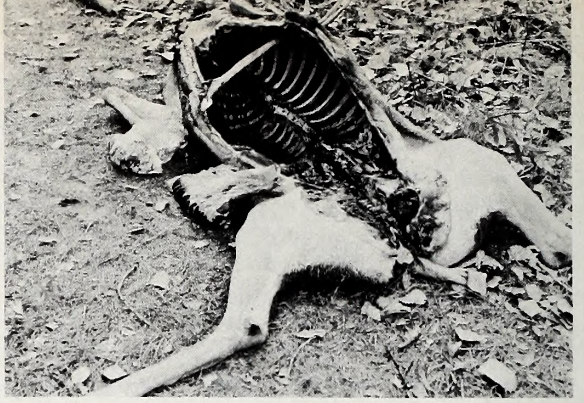


FIGURE 6. Prop open the chest and abdominal cavities with clean sticks to help cool the meat.

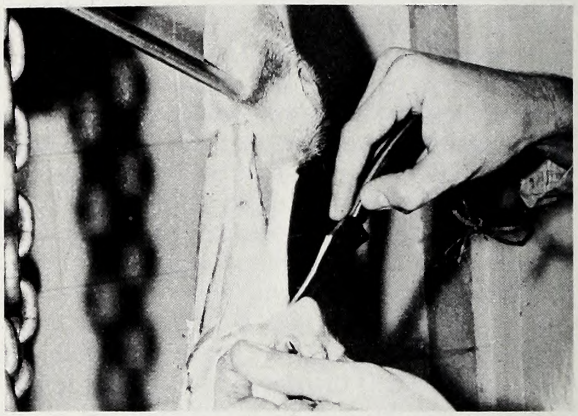
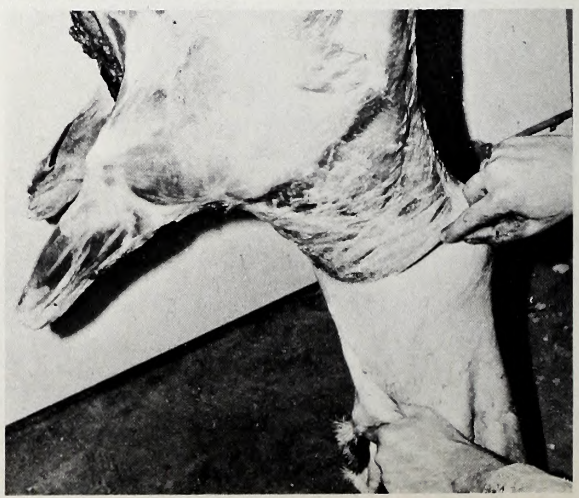


FIGURE 8. In skinning the back legs, be careful not to cut the musk glands. FIGURE 9. (below) Continue skinning the body by "punching" hide free. FIGURE 10. (lower) Cut off the front legs, remove the hide and head.



NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

New Low Price Offer for Wildlife

Not many things have come down in price lately, but with the new price offer found on page 27 of this issue you can save money. A 3-year subscription (new or renewal) to "WILDLIFE IN NORTH CAROLINA" is now only $5. We hope you use the subscription blank or pass it on to a friend.

North Carolina Natural Heritage Program

Brochures describing this new program which is inventorying and protecting important natural areas of the State, are available free of charge from: N. C. Natural Heritage Program, DNER, Box 27687, Raleigh, N. C. 27611. This program is administered by the Dept. of Natural and Economic Resources with support from the Nature Conservancy (see page 18 of this issue).

Eno River Calendar for 1977

Many of the birds seen along the Eno are featured in pen and ink on this year's Eno River Calendar. The cost is $3.50 plus 60 cents postage and handling. Send your order to: Carol Schueler, 521 Brookwood Drive, Durham, N. C. 27707.

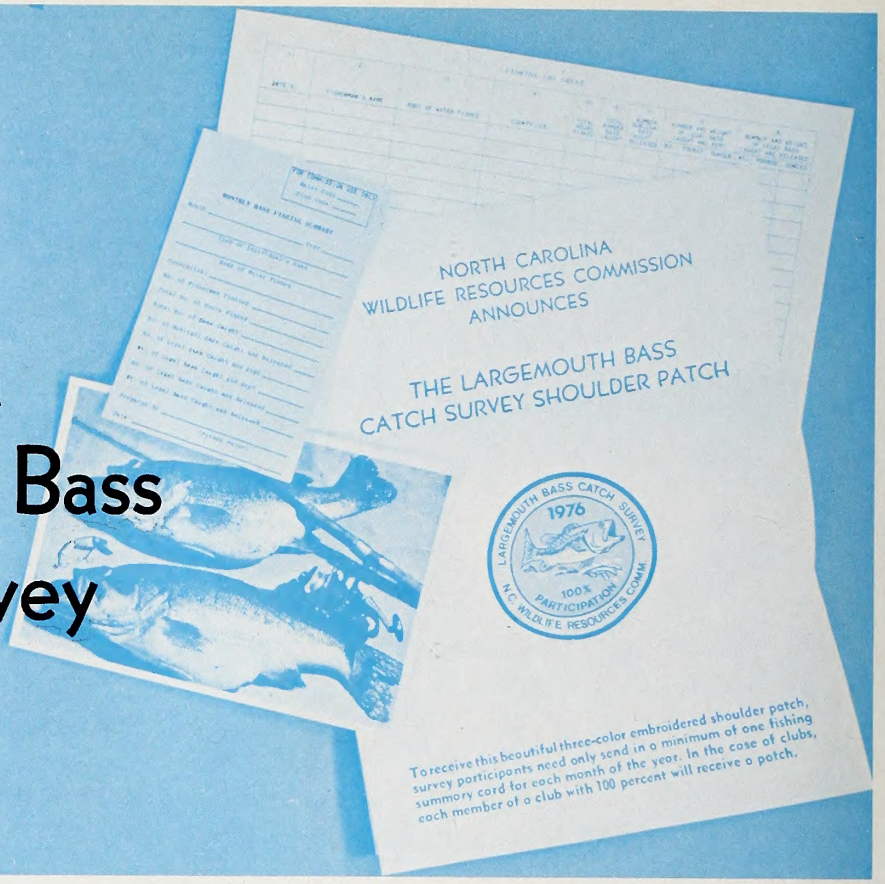
Free Wildlife Planting Material

The Wildlife Resources Commission has free wildlife habitat plantings for distribution. Application forms for these are available from County SCS offices, County Extension offices, field biologists, wildlife enforcement officers or by writing Wildlife Plantings, Wildlife Commission, 325 N. Salisbury Street, Raleigh, N. C. 27611. Available are annual and permanent (perennial) seed mixtures and a limited supply of several other types of planting materials.

Have You Seen A Cougar?

If you have seen a mountain lion in North Carolina, the State Museum of Natural History wants to know. Please call them collect at 919-829-7451 or write them at P.O. Box 27647, Raleigh, N. C. 27611, and tell them about it.

North Carolina Largemouth Bass Catch Survey



by Larry J. Birchfield
Fisheries Biologist

HOW is the bass fishing in your favorite lake? Is it improving, staying about the same or getting worse? Are the bass running larger, or smaller? Is the lake being overfished, or could it stand more pressure? The answers to these and many other questions would be of great interest to North Carolina's bass fishermen. They are also of considerable interest to the fisheries biologists who manage and regulate bass fishing in the State.

In May, 1975, the North Carolina Wildlife Resources Commission decided to ask fishermen in the State to help answer some of these questions by participating in a survey of bass populations across the State. The success of such a study must depend entirely upon the willingness of the State's bass fishermen to supply information. So far, it's gotten off to a good start.

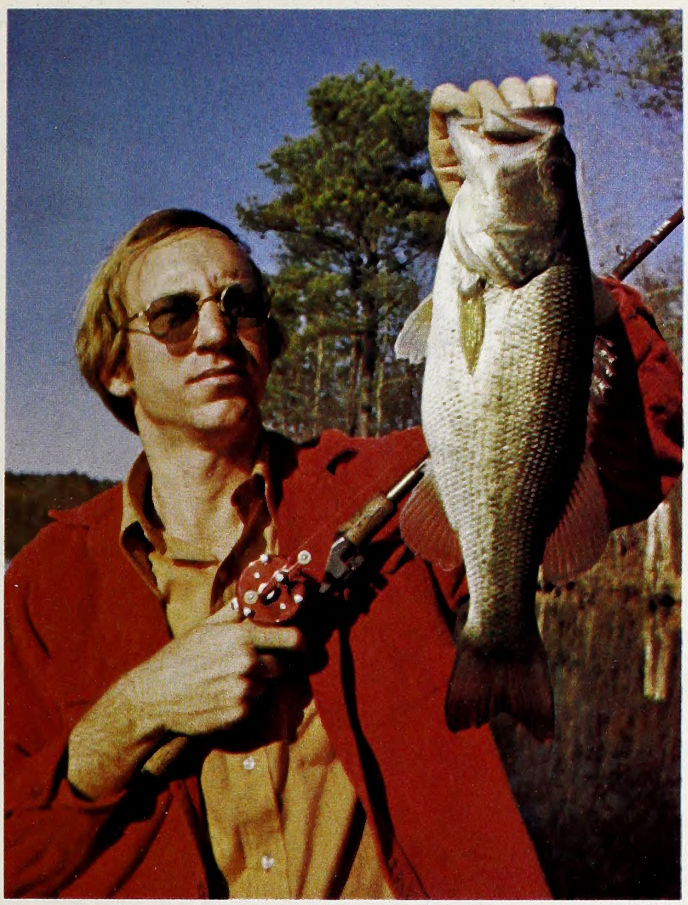
Beginning this past spring, anglers who fished primarily for large-mouth bass were encouraged to participate in the statewide largemouth bass catch survey. At the same time, the North Carolina B.A.S.S. Federation and the N. C. Wildlife Federation asked their memberships to take part in the survey. Both organizations provided the Wildlife Resources Commission with complete club rosters to facilitate contacts with individual clubs. The study will continue and hopefully it will grow. Plans call for the bass catch survey to continue for five years.

Each individual or club participating in the survey is asked to maintain a fishing log. Information recorded in the log for each trip includes body of water fished, hours fished, number of bass caught and released, number and weight of legal size bass caught and retained, and the number and weight of legal size bass caught and released. At the end of each month, postcards, summarizing the information from the fishing log sheets for each of body of water fished, are mailed to the Wildlife Resources Commission. The log sheets and monthly summary cards are furnished by the Wildlife Commission.

Information taken from the summary cards is used to compute catch and harvest rates for each body of water. Since all catch data is provided by anglers fishing for largemouth bass, these catch rates can be considered indicators of the quality of bass fishing supported by each body of water. Annual comparisons of catch rates for individual bodies of water will be made to detect trends occurring in the catch and harvest rates. This type of data will provide a basis for evaluating future management plans which are designed to improve bass fishing. This information will also identify waters where problems may exist.

A detailed annual summary of the data is furnished to all survey participants. Included in the summary is a ranking, based on catch rates, of the top reservoirs, lakes, rivers and streams. Also, each participant who returns at least one summary card for each month during a year will be awarded an embroidered patch identifying him or her as a participant in the study. In the case of clubs, each member of a club with 100 percent participation will receive a patch.

This project is partially funded by the federal Dingell-Johnson Program under the Federal Aid in



PHOTOS BY JIM DEAN

Body of Water	Total Hours Fished	Total Number Caught	Percent Legal Size	Percent Legal Released	CPUE Fish/ Hr.	*CPUE (Legal Size only)
Sounds	18	27	37.0	30.0	1.50	0.56
Bays	6	8	50.0	100.00	1.33	0.67
Reservoirs	8,285	4,350	50.5	56.0	0.53	0.31
Lakes	875	420	36.8	31.8	0.46	0.17
Ponds	473	392	42.8	42.1	0.83	0.36
Rivers & Streams	2,853	1,541	63.6	36.8	0.54	0.35
Total	12,510	6,716	57.7	52%	0.54	0.31

Table 1. 1975 largemouth bass catch rates for various types of water fished.
* Catch Per Unit Effort.

	CPUE (legal-sized)			
Body of Water	Spring	Summer	Fall	Winter
Sounds	0.67	0.0	—	—
Bays	1.00	0.33	—	—
Reservoirs	0.36	0.30	0.25	0.28
Lakes	0.08	0.21	0.07	—
Ponds	0.49	0.26	0.51	—
Streams & Rivers	0.43	0.37	0.26	0.0
Total	0.37	0.30	0.25	0.28

Table 2 CPUE of largemouth bass by season for various categories of water in North Carolina.

Fish Restoration Act. The federal funds for this program come from a 10 percent manufacterer's excise tax on fishing rods, creels, reels, and artificial lures, baits and flies.

During the period May 1, 1975, through December 31, 1975, a total of 39 B.A.S.S. clubs participated in the survey. Other participants included six wildlife clubs and 46 individuals. Of those fishermen who expressed an interest in participating in the survey, 53 percent mailed in catch reports in 1975. Twenty percent of the participants returned at least one catch summary card for each month during the year, thus exhibiting 100 percent participation in the program.

During the 1975 calendar year, data were collected from two sounds and bays, 21 reservoirs (greater than 1,000 acres) and 10 lakes (less than 1,000 acres, but greater than 50 acres), several ponds (less than 50 acres), and 30 rivers and streams.

A total of 12,510 hours of fishing effort was reported in 1975 and 6,716 largemouth bass were caught. This gives a catch per unit of effort (CPUE) of 0.54 fish per hour. Of the 6,716 fish caught, 3,887 were legal size (57.7 percent), making the statewide catch per unit of effort for largemouth bass 12 inches and over, at 0.31 fish per hour. Fifty-two percent of the legal fish caught by participants in the survey were released. The average weight of the legal fish caught during the 1975 season was 1.8 pounds.

Catch rates ranged from 0.46 largemouth bass per hour in lakes to 1.50 bass per hour in sounds (Table 1.). When only legal-sized bass are considered, the lowest catch rate was again in lakes (0.17 fish/hour), but the highest rate was in bays (0.67 fish/hour).

The catch per unit of effort was found to vary with season of the year. However, there was not as much variation as one might expect (Table 2.). North Carolina reserviors had the best largemouth bass fishing during the spring. The best bass fishing on lakes was found to be in the summer, and the best season for fishing on ponds was the fall. The highest CPUE in streams and rivers was found to be in the spring.

Additional survey participants are needed. Those anglers interested in taking part in the North Carolina Largemouth Bass Catch Survey should work through their local B. A. S. S. clubs if they belong to one. If they are not members of a B. A. S. S. club, they can help individually. Bass fishermen can get their forms or obtain more information by writing Larry Birchfield, Division of Inland Fisheries, N. C. Wildlife Resources Commission, 325 N. Salisbury Street, Raleigh, North Carolina 27611.

It makes no difference to the Wildlife Commission whether the fish is harvested with a cane pole or a bass rod, nor does it matter whether the fish strikes while the angler sleeps on the bank or while he's fishing in a tournament, as long as the fishing is legal. The Commission's concern is in monitoring the harvest of the resources so that we can recommend effective regulations to protect sportfishing. Help us help you, the bass fisherman, in making sure there will be plenty of good bass fishing in years to come. ▲▼

EVENING GROSBEAK
PHOTO BY AUTHOR

Winter Birds

by Michael A. Godfrey

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DAWN broke an hour ago, cold, overcast. I sit before my breakfast room window, certain of my thoughts with the little sharp-shinned hawk who yesterday flushed from the woods behind the garden a wave of robins cresting toward me. My inner feet march lightly to the distant drummer that keeps me comfortably out of step with the world of shopping centers, with bins of fruits and vegetables individually sealed in plastic as if the pesticides might otherwise escape. I concentrate on the seed feeder ten feet on the other side of my window; on the slab of suet strapped around me. The plastic is a figment. Soon it will be gone. Like the marvelous lead plumbing that poisoned Rome, it will one day set scientists to jabbing at one another with pipe stems and clucking at the naive technologies of the ancients.

Last evening a late "feed" nearly emptied the seed feeder. I open the door. The birds scatter. I fill the bin with sunflower seed, re-enter and discard the empty plastic bag.

A pane of glass six feet square separates me from the feeder. A screen separates the birds from the glass. Without the screen the birds mistake the glass for a

clear passage and the carnage is horrible. A half-hour ago, in the day's first light, I addressed a drum of oak with wedge and sledge hammer, for me a ritual outpouring of any frustrations my dreams did not ventilate. The quartered oak crackles now in the fireplace behind me and as in Aldo Leopold's early morning vigils in *A Sand County Almanac,* the coffee pot whets my senses. I am ready to record the goings-on at the feeding stations.

A chickadee tumbles from the cover of a big cedar and hits the feeder, scolding, before I am back in the house. He grabs his ration and runs before the big boys get into the act. He holds the sunflower seed to a limb with his feet and manfully hammers it open. The slightly larger tufted titmouse does not have to be quite so bold; she allows a few moments for the dust of my disturbance to settle, then, in a quick pass, grabs a single seed and duplicates the chickadee's hammering.

Now come the purple finches, a group of half a dozen, leapfrogging past one another through the branches. Their advance seems to be a game: "Let the other fellow go first and expose himself to danger, but I can't stand it if he gets to the feeder first so I'll pass him." A female lands on the feeder. Then another. A squabble ensues. The feeder has two seed-dispensing sides, mind you, but the female finches go to the same side and fight over it. One prevails and the loser retires to a limb. Then returns for further squabble. So far neither has eaten a seed. A chickadee steals one while the fracas rages. Finally, the two females claim opposite corners and settle in, shelling seed after seed without moving. The males, having disdainfully witnessed the warfare, begin to alternate at the opposite shelf, feeding in relative peace. The chickadees and titmice visit, as prudence permits, each pass made with the timing and trepidation of a runner stealing a base.

Now a goldfinch arrives, transformed from the brilliant garb in which it plucked the down from last Autumn's thistle. The goldfinch, scarcely more than half the purple finch's size, stands up to the female purple finch's attack—and wins! (Although I suspect the purple finch may have eaten about all she wanted anyway.) The goldfinch, too, is a stationary feeder, firmly occupying a spot at the ledge and showering the ground with sunflower shells.

And millet, for which none of the birds yet mentioned cares very much. The frosted ground is now crisscrossed by a hopping blur of juncos and white-throated sparrows. Neither bird can bring itself to sit at the feeder. Nor can the towhee who just arrived to scatter the smaller fringillids.* They scratch and hop and pick over every square inch again and again, salvaging the spilled grain. As they dance, I begin to note who's who in the pecking order. The juncos come in a variety of sizes and colors. The immature birds are brown-backed, the females grayer, and the mature males almost black above the stark countershading of their white bellies. White is visible in the outer tail feathers of all the juncos when they fly, but on the ground the white is demurely covered. Except by a big male who scatters the others, dashing through the flock flashing his white "V" and claiming the best pickings. He is clearly alpha junco.

Toward the edge of the circle of ground feeders, I notice a large, brownish bird with rusty flecks on its breast. My thrasher, I mark with satisfaction, having been concerned at his absence for the past few days. But no! It has a thrasher's body but the beak of a fringillid. A fox sparrow! I should have known from the bird's agreeable demeanor that it wasn't my brown thrasher, whose first gesture usually is to charge and disperse all other gleaners. The fox sparrow, the first I've seen this year, hunkers quietly and pops the paper-thin hulls off the millet. The fox-red tail and coverts mark him as the largest sparrow in the east.

Back at the feeder, the scene has changed from brown and purple to black and gold. The evening grosbeaks are mustering. They make no violent gestures on arrival, to other birds or to one another. Yet they quickly become sole occupants by virtue of their size. They settle in and shell sunflower seds. Piles of them. The grosbeaks alternate at the feeder; the smaller birds cluster hungrily in the nearby branches. Twenty minutes pass. The grosbeaks have measurably lowered the level of seed in the bin.

The colors shift abruptly once more, this time to blue. The bluejay is one of the few birds formidable enough to displace the grosbeaks. But, again, the grosbeaks are full and the bluejay brazen with hunger. The grosbeaks' irritated chimes fade; the bluejay briefly shrieks its triumph, then falls to feeding. It grabs a seed, tilts its head back and swallows, again and again. I used to think bluejays were endowed with special plumbing capable of digesting the sunflower seed coats. But avian insides are designed to save weight; cast iron stomachs are too heavy. So the intestines are short, and the crop, in many birds, holds the unusables for immediate regurgitation. I keep an eye on the bluejay. It flies to the edge of the woods, coughs up a seed, holds it against the limb with a foot and shatters the protective seed coat with a single blow.

The feeder is like the center of a kaleidoscope with new colors converging on it from all sides and old colors simultaneously outbound. Blue is out, red is in. The cardinal has always seemed to me a misplaced bird of the tropics. It is by far the most colorful of the winter birds and, with the possible exception of the

Winter presents some problems for song birds and game birds if the weather is bad for prolonged periods. This towhee has ventured out in the snow in search of food.

*Member of the family Fringillidae, the cardinals, finches, sparrows, etc. having heavy conical bills for cracking seeds.

painted bunting, is perhaps the brightest bird on the continent.

Two males now spar at the feeder. A third arrives and the first two flee as if the newcomer were a hawk. Alpha cardinal erects his crest and postures briefly on the ledge, then digs in. He cracks a seed, then scratches several to the ground for his retinue of ladies and for the lesser males he just evicted.

And so it goes. I have passed an hour watching the badinage of colors between the major winter birds at or under the feeder. Occasionally a less frequent visitor takes a few seeds—a chipping sparrow, a downy woodpecker, a redwing, a field sparrow, a cowbird. A pair of mourning doves whiffles to the ground, beads of iridescence gleaming down the sides of the male's neck. A white-breasted nuthatch arcs in, emitting its endless snickers. It grabs a seed and arcs out again to wedge the seed in a bark crevice and hack it open. The titmice and chickadees never miss an opportunity. And every so often the feeder dances under the impact of a red-bellied woodpecker who, like the bluejay, scatters the smaller diners and hauls off a cheekful of seeds to be opened at leisure.

At lunchtime, I smear another big spoonful of the peanut butter-bacon fat-cornmeal goo on the maple's bark. A kinglet appears, hangs sideways, then upside down, and finally picks off several mouthfuls while hovering. He retires to a nearby shrub and wipes his beak on a twig. Suddenly his crest becomes visible. He flits nervously through the shrub as if pursuing midges, then takes off and crosses 50 yards of open lawn to attack another kinglet in another shrub. From this distance I cannot see the bodies of the tiny birds, but their erected crests look like two red Christmas lights gyrating in the shrub's interior. One flees, the other's crest subsides, and both meld into the wind-tossed detritus of winter vegetation.

A bluebird hovers briefly, touching the air gently with her wingtips. She clings to the bark and gobbles. A myrtle warble appears, not hostile but businesslike in spite of the lemon-gold foppery about his rump and shoulders. Soon both are back in the branches, wiping the white flecks from their bill bristles.

I seldom see just one or two birds at the feeders. They all arrive together for a "feed" and depart together when either finished or frightened. They return more quickly if the feeder is handy to some protective shrubbery into which they can retire every few minutes to rest. Or to escape the hawks that lurk in the sky and in their minds.

Ah, you say, hawks are a thing of the past. I live in town where there are no hawks to molest my birds.

Well, more than one urban bird-lover has been treated to the spectacle of a sharp-shinned hawk blitzing through the yard to snag a grosbeak off the feeder and pluck it on the spot. The winter birds move into the towns and cities because that's where the people are. People mean sunflower seed and pyracantha. The little sharp-shin, the male hardly bigger than a robin, finds it can winter unobtrusively in the parks and gardens and help himself to the urban winter birds. It is possible, just possible, to witness this ancient and essential drama even in the heart of a big city. The sharp-shin is part of the ordained North American life scheme. He is entitled to his prey, rural or downtown.

Not so the domestic housecat, a creation of man's genetic tampering. *Felis catus* probably never existed anywhere in the wild and certainly is not a natural or legitimate predator in North America. I never stopped to think of it this way until a neighbor of mine once asked me into his yard, pointing to a cat in a cage-type trap and asking if it were my cat. It was, and what, I demanded, was it doing in that trap?

"That's what I want to know," he said. "If you're going to keep a cat, keep it—the hell away from my birds. Like in your house."

The neighbor explained, and I ultimately came to agree, that the housecat's hunting instinct makes it a formidable threat to birds and small mammals. The cat is new on the scene and the prey is not genetically endowed with defenses against it. The two did not "grow up" together over zoologic time. And, most diabolically, cats fed at home and turned loose on the neighborhood to "play," use the energy subsidy we give them to harass the legitimate wildlife, It's not the cats' fault. It's ours.

Evening nears. I return to my bird-viewing chair. The feeders and the ground are aswarm with fringillids. Suddenly they flush, except for a few juncos who freeze to the ground. A huge spearshaped bird arcs in, wings folded, then swoops upward and fastens to the maple's trunk. Warily, but loudly, the red-bellied woodpecker backs down the trunk toward the suet. He will feed lustily with the setting sun before retiring to his roosting cavity. His approach to the suet is accompanied by a litany of hoots and a ritual of cautious assents and dissents, of disappearances to peering from the "safe" side of the tree. He is like a man building courage to dash into a flaming house to save a treasure. Then, with contrasting cool, a nuthatch hitches headlong down the maple trunk, sounding its mischievous yawks and giggles to pre-empt the larger bird at the suet cake.

The shadows lengthen, then fade. Bird after bird retires. The feeding conversation thins. Now I hear only the metallic clicks of the juncos—something like ice cracking on a pond—and the faint, plaintive inquiries of the white-throated sparrows. How totally, I muse, these two birds mean winter to me. If I heard their voices in a summer evening I would be subconsciously confused and anxious long before I knew why. The junco is called "snowbird," for its migrations closely follow the edge of winter and the ground on which it feeds is often white with snow. The white-throat is a close relative, but lingers awhile in spring after the junco decamps. Both birds now feed on, their shapes visible only when they move, their colors faded into the day's afterglow.

Then they, too, are gone. I open the door and stand on the porch to feel the bite of the winter dusk. As if on signal, the white-throats break into song, shattering the evening's quiet with their only outburst of the day. The 15 minutes that precede hibernal darkness are given over entirely to the surging chorus of the white-throats. Their explosive, high-pitched BEEET sounds at one-second intervals from the roosting perches in every shrub and cedar. I could not say how many winter evenings the rising white-throat crescendo has bid me hurry to gather kindling for the fire. ⬍

This is excerpted from A CLOSER LOOK by Chapel Hill author Michael Godfrey. In this new volume, Mike writes about his life style built around a love for nature. It is a beautifully illustrated and sensitive book. $14.95 from Sierra Club, PO Box 7959, Rincon Annex, San Francisco, CA 94120.

STEM TO STERN

by Ed Jenkins

• Every boating trip begins with the first step; often a briefing over an up-to-date chart or map is useful in planning an outing on the water. Having and using the proper maps and navigational knowledge of the water and can also open a new world of boating to those who have never before "piloted" their boats.

Maps and charts can play an important part in most boating activities. For example, bass fishermen know the value of topographic maps and use them to locate fishing structures where fish may be taken when most people have given up for the day. Navigational charts enable coastal fishermen and boaters to locate their position, water depths and good fishing areas such as the "WR4" buoy off Wrightsville Beach. Skiers and trailer boaters find power company and Corps of Engineers maps very useful in locating launching ramps, picnic areas and marine facilities on the large lakes in the state.

The problem most of us face is not knowing what charts and maps are available or where to get them. The costs of boating maps and charts are very reasonable and are seldom a deterrent from owning an up-to-date map of a favorite lake or body of water. Maps of power company lakes or Corps of Engineers lakes only cost a 13¢ stamp to obtain. Nautical charts go for $3.25 each, while the more detailed fishing and boating guides, available at most sporting stores, cost $5 per copy. Although the latter represents a considerable investment for many of us, they may be well worth the costs, especially to fishermen and boaters new to an area or type of fishing, and they may pay for themselves with the increased size of one's catch.

Let's start with the nautical charts. These very helpful charts can be used either for navigation or placed on a wall or bulkhead to lend a nautical air to a room. They sell for $3.25 each and are available from authorized sales agents or by writing: Distribution Division (C44), National Ocean Survey, Riverdale, Maryland 20840. First, ask for a nautical chart catalog of the Atlantic and Gulf Coasts to determine which charts you'll want to buy. Then just order the charts you want from the catalog. Of course, it's much easier and quicker to purchase these charts from an authorized sales agent if there is one in your area or on the way to your fishing spot.

Topographic maps are useful to fishermen who want to explore the headwaters of streams or learn the bottom contour of a lake. To get these maps, write to the Distribution Section, Geological Survey, 1200 South Eads Street, Arlington, Virginia 22202, and ask for a free index to topographic maps of North Carolina. Again, you'll want to check the index for the particular map you want. Raleigh Blue Printers, 313 West Martin Street, in Raleigh, North Carolina has an index and topographic maps. The maps sell for about $1.50 each.

Topographic maps of Lake Norman and Lake Wylie are available at no charge from Duke Power Company. Duke Power also has recreational maps of Lake Norman, James, Rhodhiss, Hickory, Lookout Shoals, Mountain Island, Wylie, Fishing Creek, and Waterlee. All are free and available by writing: Corporate Communications Department, Duke Power Company, P.O. Box 2178, Charlotte, North Carolina 28282.

Maps of Lake Gaston and Roanoke Rapids Lake are available at no charge from Virginia Electric and Power Company by writing Mr. Lloyd Andrews, VEPCO, P.O. Box 370, Roanoke Rapids, North Carolina 27870.

Kerr Lake maps are available by writing Kerr Reservoir State Recreation Areas, Route 3—Box 800, Henderson, North Carolina 27536. Maps of Kerr Lake as well as W. Kerr Scott Reservoir are also available from the Corps of Engineers

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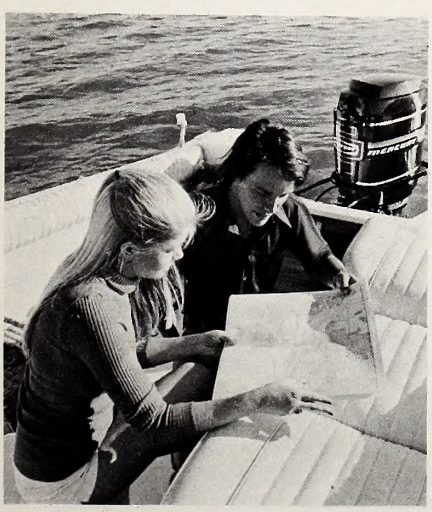

Charts and maps are important to the boater and make water sports and travel safer and more fun. Here are but a few publications available.

THE NATURE CONSERVANCY:

Land Conservation Through Private Action

by David E. Morine
Director of Land Acquisition, The Nature Conservancy

IF you drive straight across the breadth of North Carolina, from the Tennessee border to the beaches of the Atlantic Ocean, two facts about the state are apparent. First, North Carolina is one of the most beautiful and naturally diverse states in the U.S., and, second, the Tarheel State is growing rapidly. From the second-home developments that now dot the once wild Appalachians and the quickly urbanizing Piedmont, to the vacation and recreational communities that sprawl along the coast between Elizabeth City and Wilmington, North Carolina's great natural heritage and its desire to grow and develop are meeting head-on.

Up until the 1970's, the choice between growth and land preservation was not a problem in North Carolina. There was plenty of room for everyone. Then, around 1971—largely as a result of the Bald Head Island controversy—many North Carolinians suddenly realized that the land which comprises their great natural heritage was, in fact, a finite quantity. More importantly, they realized that the State's citizens in certain areas would have to begin choosing between preservation and development. The friends of the Eno were one such group of citizens.

The Eno River runs through the Piedmont and has two sources and two forks. Both branches of the Eno—before they reach Hillsborough near Chapel Hill—are lined with mill sites and historical markers of North Carolina's rich history. Beyond Hillsborough, the river meanders its way past Durham through sections of unspoiled wilderness that contain swimming holes with curious names and histories, intriguing rock formations, bluffs covered with rhododendron and mountain laurel, and countryside filled with an abundance of flowers, ferns, and wildlife.

The headwaters of the Eno River are located in the "Research Triangle" of Durham, Chapel Hill, and Raleigh—the heart of one of the fastest growing metropolitan areas in the U.S. Because of its location and uniqueness, the land surrounding the river began to lure the expanding population of the City of Durham. But the friends of the Eno River strongly felt that Durham's growth could be better accommodated in other areas of the city where the land was not so unique and was suited for development. In early 1972, armed with this conviction and an unlimited capacity for work, the friends of the Eno asked The Nature Conservancy for assistance in preserving the Eno River.

PHOTO BY S. BOURNIQUE

The North Carolina portion of the Great Dismal Swamp (Camden County) is now under public ownership. The Weyerhaeuser Company donated 11,000 acres; Union Camp Corp. donated another 3,800 acres of the Chowan Swamp.

The Nature Conservancy, a non-profit conservation organization located in the suburbs of Washington, D.C., is best described by the slogan on its door, "Land Conservation through Private Action." Incorporated in 1951, the Conservancy has in the last 25 years saved over one million acres of America's most significant natural areas—forests, marshes, beaches, prairies, mountains, and islands. Starting with a membership of only 300, the Conservancy now has approximately 25,000 members. It hopes to triple that number by 1980 because more and more people are realizing that, despite the efforts of government, America's remaining natural areas are being developed and destroyed every

The historic and scenic Eno River in Orange and Durham counties will form the focal point of the Eno River State Park. This will be one of the finest parks of its type in any suburban or urban area, once completed. The river itself is rocky and swift during normal flow periods. It is the home of the Roanoke bass, a fish with a very restricted range in North Carolina.

PHOTOS BY TED DOSSETT

The Eno was subjected to misuse for many years. Even now, problems of overuse exist and place heavy burdens on the present State Parks and Recreation staff stationed on the area.

day. This includes the destruction and loss of vital wildlife habitats, and the disappearance of many already endangered plant and animal species.

To realize the full extent of this loss, we need to understand the significance of species diversity or, more properly, ecological diversity. Every single species or organism fulfills a role that affects each of us, either directly or indirectly. We exist because of our dependence on the existence of other organisms; and each plant and animal species, no matter how rare or how unknown, is a potential resource of indefinite value to man. We need the natural world, the life it supports, and its natural resources as possible sources of food and medicine, and to provide for an environmentally stable, livable earth. The total destruction of ecological diversity also means the destruction of *Homo sapiens*.

The Nature Conservancy uses three basic techniques to acquire threatened natural areas. One technique is to buy the land outright with funds raised through public subscription. Another is to purchase endangered areas and hold them until such time when a governmental agency has the necessary funds to repurchase and safeguard the land. Third, the Conservancy accepts full or partial donations of land from private individuals and corporations. It was this last method that initiated the Conservancy's involvement in the Eno River and has led to the preservation of this unique area.

For many years, Drs. Frederick and Mary Bernheim had owned over 90 acres of land along the Eno River. Their property was a key tract because the Conservancy felt that if it could acquire the parcel, other landowners along this stretch of the River would also be interested in preserving their properties. The Bernheims were very concerned about protecting the Eno River. After meeting with the Conservancy and learning how the organization planned to preserve the Eno, the Bernheims agreed to donate their land.

As hoped, after the Bernheims' gift was announced, other nearby landowners quickly followed suit and either donated their properties to the Conservancy or sold their land at well below the properties' fair market values. At the same time, North Carolina's State Parks Department, which had long been interested in creating a state park along the Eno River, rejuvenated their plans. Working directly with the City of Durham, the Parks Department developed a new plan for a park along this 20-mile stretch of the river. Once completed, the Eno River State Park will be one of the finest parks of its nature in any urban or suburban area.

Based on the Eno River experience, The Nature Conservancy developed an excellent working relationship with the State Department of Natural and Economic Resources. Also, the Conservancy felt that if the Department had some funds for land acquisition, there was probably a considerable amount of untapped interest and support for land preservation in the private sector. With this fact in mind, the Department of Natural and Economic Resources brought its case to the 1973 session of the North Carolina legislature, and 11.5 million dollars was appropriated to the Department for land acquisition. In addition, under the direction of the Conservancy, private support immediately began to supplement these state funds.

The Georgia Pacific Corporation donated substantial areas of land in Chowan Swamp and Merchants Mill

Over 1,600 acres on Roan Mountain have been saved as a natural area by the efforts of the Nature Conservancy. This privately funded agency does not retain ownership of such areas, but assists in the acquisition of the lands.

Pond. Mr. R. Philip Hanes, a board member of the Conservancy, pledged over 1,100 acres of land he owned around Stone Mountain to serve as a nucleus for the Stone Mountain State Park. Shareholders of the Core Banks Hunt Club contributed 40 percent of their stock to the Conservancy so that this land could be protected. More recently, the Weyerhaeuser Company donated 11,000 acres, valued at six million dollars, in the Great Dismal Swamp; and the Union Camp Corporation donated another 3,800 acres of the Chowan Swamp.

The First Union Bank of Charlotte provided a different kind of assistance when Mecklenburg County wanted to acquire and protect 427 acres on Mountain Island Lake as a county park. Unfortunately, the owner of the property—a subsidiary of Duke Power—had to sell the land immediately and Mecklenburg County could not obtain the necessary funds soon enough. Since it was obvious that such a park would greatly benefit the community, First Union provided The Nature Conservancy with a loan of approximately one million dollars at a very favorable rate. This timely financing allowed the Conservancy to preacquire the land and hold it until the County was able to obtain its funds.

With this type of private support, the Conservancy has been able to assist public and private conservation efforts in North Carolina by acquiring over 65,000 acres of significant natural areas in the last four years. (See attached box.) The fair market value of these lands has been estimated at approximately 20 million dollars, and only 50 percent of this total has come from state, local, or federal sources. The other half has been provided entirely by the private sector—

North Carolina Projects

Name	County	Acres
Boyd Forest	Moore	403
Chowan Swamp	Gates	13,659
Core Banks	Carteret	950
Eno River State Park	Orange/Durham	436
Freelund Tract	Macon	89
Dismal Swamp	Camden	42,491
Hymettus Woods	Wake	5
Jocky's Ridge	Dare	62
Merchant Mill Pond	Gates	925
Mountain Island Lake	Mecklenburg	427
Olive Tract	Macon	4
Pinky Falls	Macon	6
Roan Mountain	Avery/Caldwell	1,645
Standing Indian Mountain	Clay	1,600
Stone Mountain	Wilkes/ Allegheny	2,852
Timber Ridge Preserve	Jackson	20
Henry M. Wright Preserve	Macon	22
	TOTAL:	65,596

individuals, corporations, and foundations within the State that wanted to see the best of North Carolina's natural areas preserved.

Of course, North Carolina will continue to grow. Everyone realizes that the entire state cannot and should not be preserved. However, no one can deny the significance of natural areas like the Eno River, the Great Dismal Swamp, Roan Mountain, Merchants Mill Pond, Core Banks, and Stone Mountain. But now that these examples of the State's natural heritage have been preserved, where should the conservation community continue to apply its limited resources?

Fortunately, the Mary Reynolds Babcock Foundation in Winston-Salem recognized this problem and agreed to help fund a joint program between the Department of Natural and Economic Resources and The Nature Conservancy. This program, called the North Carolina State Heritage Program, will determine the state's most significant natural areas through an intensive statewide inventory. Relevant data on natural areas throughout the state will be collected and stored in an on-going system or data bank and will provide the information needed to determine the areas most worthy of protection. For example, researchers will classify North Carolina's rare plant and animal species, plant communities, and critical habitats, as well as important historic and recreational sites and outstanding geologic features. In this way, information on the existence, numbers, condition, status, and location of all these significant examples can be objectively ascertained. Once this information is accumulated and stored in the Department of Natural Resources, North Carolina can go about setting protection priorities and preserving its natural heritage. In addition, the data can be used by other state, local, and federal agencies, and the private sector to determine how to best accommodate the State's future growth, and to show which areas safeguard what is endangered or rare.

Significant natural areas are often destroyed simply because their uniqueness has not been documented. Hopefully, through the State Heritage Program, the Department of Natural and Economic Resources and the Conservancy will help the people of North Carolina and their elected and appointed officials to be-

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THE GREEN RIVER AS A RESOURCE

Part III in a series
by An Painter

With photographs by Sam Thomas and An Painter

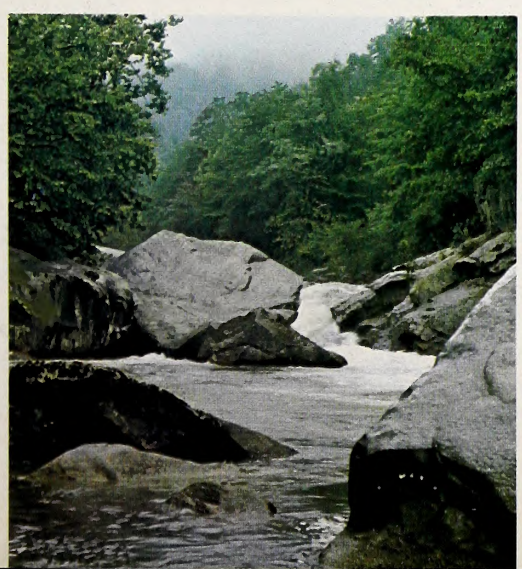
THE Green River is a narrow, small volume stream, not very well known, which flows through several southern tier counties in North Carolina. The only generalization holding true for its entire length, from Standingstone Mountain on the South Carolina Border to the river's confluence with the Broad at the Rutherford County line, is that this is a beautiful river. Other than that, well . . . Some of the steepest rapids and falls in the state are found along the whitewater section of the Green. Sometimes the river is actually green in color. Sometimes the river is as pastoral as a farm creek. Other times, when the Green floods, its brown swirling waters spread out for hundreds of feet to either side of the river bed. Some parts of the Green are well known, paradoxically, but to small devoted numbers of canoeists in North Carolina, South Carolina, and Georgia.

In the preceding two issues of "Wildlife," I have tried to introduce the reader to the little-known Green River and some of the people who bring this river to life. The Green River flows through Henderson, Polk, and Rutherford counties. (In Tennessee, **the** Green River flows through Muhlenberg County, according to the folk song). Knowing our Green River is loving it. Part I presented the lands surrounding the river and the geography of the river itself. Part II was a travelog by foot and by canoe along the river and within the Gorge and Cove. Part III deals with the Green River as a resource.

Uses

The word resource implies a relationship between human beings and a valued object. The relationship is one of use. A way of assessing this beautiful river is in terms of its usefulness to man. Thousands of years ago the lands around the Green were dotted with caves used as rock shelters. From 8,500 BP (Before Present) for at least 7,000 years thereafter, these shelters had been used as temporary camps by succeeding bands of Archaic Period hunters. Stanley Culture, then Yadkin culture, and eventually Cherokee Indians lived in these lands and camped in these shelters.

First view of Fishstop Falls.



In the 1700's white settlers in the Piedmont moved west to the foothills of the Appalachians. Transformation of forest type and encroaching human activity had already produced a decline in the abundance of wildlife, and soon there was competition between Indian and white at the frontier's edge. Skirmishes were fought until Governor Tryon established a line demarcating Cherokee and white lands in 1768. The Green River land lay in the Cherokee region. In 1776 the settlers attacked and defeated the Cherokee near Howard's Gap (where I-26 mudslides slip today), driving the Indians out of the Cove region and into Henderson County land across the river.

The first white settlers in the Green River Cove arrived at Gadd Creek in 1776. This Green River community has grown and declined along with the fortunes of the textile mills to the south which have been its major employer for years. Now there are about twelve families in the Cove, and no Cherokees at all.

The rock shelter which has provided all this information about the first humans in the Cove has been excavated by students at Wofford College, every January for the last five years. This is one of the current "uses" to which Cove land is put, for the shelter is within several yards of the easternmost bridge over the Green.

Today's residents in this area own land outside the Cove as well, and some of this land is being transformed to second home development. There is a tremendous pressure toward vacation-oriented growth in the entire Isothermal region.

The imminent completion of the I-26 corridor from Hendersonville will bring with it extensive development of primary communities, businesses, and industries, as well as resort communities. The I-26 bridge crosses what is right now the most inaccessible section of the Green River. This highway will also bring nonpermanent development to the Gorge and Cove; vacation-bound motorists will pass within two miles of some of the finest recreation areas in the state.

The forested ridges above the Green River, in the section between Lakes Summit and Adger, are still hunted today. Within the hemlock-hardwood forests extending from the ridges of Cove Mountain, McGraw and Cliffield Mountains, and Long Ridge downslope to the Green and its tributary creeks, the Green River Gamelands contain whitetail deer and wild turkey (both stocked), as well as other game. Fishing is a "use" too, as the Wildlife Resources Commission has stocked many of the Green tributaries with brook and rainbow trout. Today the more traditional uses of these lands and waters compete with some recreational uses which are decidedly non-traditional.

The steep, unpeopled trails up the sides of Cove Mtn. are very popular with trail motorcyclists. When I was there for the canoe races a pack of four bikers were using a trail which began on the Cove road, near the canoe take-out point. These bikes are 375 cc and larger, stripped (no sissy seats, no mufflers) and tuned to climb 30° slopes at 35 miles an hour.

Another use of the Green River lands is by off-road vehicles. On this same weekend, on the same day, on the same road not one-quarter mile downstream, we

The Green River is known for its contrasts—quiet woods with trillium, and raging, roaring whitewater.

were passed by a convoy of four ORVs, mudsplattered and bristling with CB antennae. People living in the Cove say that both cyclists and four-wheelers are familiar sights.

Another integral part of the recreation picture is the sight of canoe, kayak, or inner-tube bouncing and sluicing along the river. Floating the Green may entail camping, as may off-road recreation, but most surely both activities require automobiles, and possibly light trailers.

Camping is also a recreational use of the Green. Most camping is within ten feet of the river itself; there is very little camping along the ridges. Camping on the Green requires automobile as well as tent, and in many cases camping is really motorhome-type rather than tent-type. A final use of the Green is by hikers. Backpackers drive to ridges and hike into the Gorge or along ridges, where they may tent overnight. Day hikers climb up from campsites along the Green to Fishstop Falls, or down from Cove Mountain to Bradley's Falls. Other campers and hikers stay at Lake Adger, boating or skiing or hiking around the marshes. Busloads of student hikers take field trips to Bradley's Falls from the Cove Road, searching out a rare moss, or investigating riverbed invertebrates.

That's a lot of recreational use! And yet there are other ways in which humans relate to this resource, as determined by the other values which the Green River area holds in other people's eyes. Extensive acreage along the Green is timbered; much of this logging today is done on tributary streams. The beds of these tributaries are mined for gravel or sand. One of the most important uses of the Green River is as a hydroelectric resources. Because water can draw off "waste" heat generated with electricity, the Green has twice been dammed in order to provide cooling water for a steam electric plant downstream.

But there is a hidden resource in the river's very geography. Because of the steep drop from Lake Summit to Lake Adger, there is the energy potential for a pumped storage hydroelectric plant. This type of plant (nuclear or conventional) returns three packets of energy for every four packets invested but the energy is produced when needed, during peak hours. The Green's lands are being put to this use today because the two power companies with pumped storage plans have arranged land purchase with this potential in mind.

Management

If the relationship of humans plus resource equals use is true, then it is also true these days that use as a concept is coming to include management. There are many forms of management in force on the Green today. One form of management is simply ownership, and the pattern of ownership along the Green has certainly channelled this river along certain pathways of use. There is also management by plan, and by inadvertance. What has happened at the Green River is that 12 overlapping, sometimes conflicting, forms of management have converged along twenty-six miles of frontier.

There are five major landholders in the Green River area between Lakes Summit and Adger. The land is forested, with the exception of the flood plain in the Cove. Timber was cut here many years ago. Many old families own acreage on both sides of the Cove: Hendersons, Bradleys, Prices. Many other residents are part-year, perhaps owning their land as heirs of the original families, or perhaps having purchased with the idea of establishing a second, or vacation, home. In any case these residences back up along the river's edge. Some land which is privately owned is logged. The logging done on these lands at the head of the Cove road has been extremely disruptive to the River itself. Any timbering has some impact on wildlife. Clearcutting downslope into tributaries of the Green, without adequate sedimentation measures, has a profound effect on the river wildlife as well.

The North Carolina Wildlife Resources Commission owns land, some purchased from the Hendersons, which also comes down to the River's edge on both sides, alongside the county road as it enters the Cove. This land extends up the sharply sloped sides of Long Ridge and Rich Mountain, and includes the river-facing side of Rich Mountain. It was along this section

Private timber management practices often result in excessive siltation and clearcut slashes like this.

that we hiked last May. This ridgetop is the watershed for Pulliam Creek and the Hungry River. The topmost elevation of the ridge—Rich Mountain Gap—is not owned by Wildlife Commission. The total owned lands comprise almost 5,000 acres. The Commission is attempting to acquire many of the inholdings within larger acreages, and also to smooth out inconsistent boundaries wherever possible. This year they will begin a major surveying project in the Green River Game Lands—a benefit to all owners adjoining Commission lands.

These 5,000 acres, together with the leased lands, are managed by the Commission in a manner influencing surrounding lands. For instance timber harvesting is not practiced, whereas game harvesting is practiced. In several locations, though, the Wildlife staff prepares or maintains wildlife openings, creating edge habitat for game animals. These are cut or old homesites are kept from growing up, and fruiting trees are planted or pruned and encouraged to bear. While these 55 mowed acres represent a small portion of the total acreage, nevertheless this form of management creates a wildlife population (predator and prey) which then impinges on other lands in its travel or feeding habits.

Another large area of land has been deeded to North Carolina State University School of Agriculture and Life Sciences. This land is being managed essentially by not being managed. Impacts in the lower Bradley Falls area due to field trips are minimal. The farmlands near Cove Road are not altered from their traditional use in any way, nor are trails or fields near Cove Creek. As an example of management by inadvertance the trails coming to Bradley's Falls from the other side of the Creek offer a striking contrast; the unescorted hiker has affected the values of the pools at the base of Bradley's Falls to a high degree. The area is clotted with refuse. Not only are visual values altered, but conservation groups enter the management picture because they periodically come into the area to clean up tons of trash each year.

One of the major landowners in the Green area is Champion International. They hold these forested acres around Lake Adger extending to its water edge. Champion has leased the wildlife rights to the Wildlife Resources Commission. As an owner-manager, Champion values Green River land for its timber yield.

The other major landowner is Duke Power Company. Duke owns 6,000 acres between Lake Summit and the headwaters of Lake Adger. The land is not continuous, and extends roughly one-half mile on either side of the River. The wildlife rights on lands in the Gorge are leased to the Wildlife Commission. Duke "manages" this land in this way: leased gamelands are left as is, except for additions made by the commission for wild turkey and deer enhancement. Duke's subsidiary, Crescent Land and Timber, does not own land in this region. One of the most significant types of management along the Green River is the water fluctuation resulting from Duke Power's releases from Lake Summit. The water depth profoundly affects most of the recreation in the Cove. Duke Power regulates this water fluctuation according to a formula involving peak power at its Cliffside plant.

The company has in the past, as a courtesy, provided information regarding the generating conditions on the Green River. Recently the Federal Power Commission determined that Duke should apply for a license at both Turner and Tuxedo hydro stations. Several other companies and impoundments were affected by this ruling. These licenses are still pending. Duke will be required to fill recreational needs in this region, and the terms of this requirement will be spelled out in the license. At this time, however, Duke Power is not required to release water into the Green in order to meet recreational needs. This complicated interrelationship has been the source of some of the hottest friction along the frontier.

The second type of management is by lease, or by means of a plan or projected use. In this category are one major lessee and five plans. Some of these plans pose direct conflicts with current uses of the Green River. If any one plan is adopted, not all current uses will be compatible with the plan, nor will many of these plans dovetail with each other. Solutions to the problems presented by use and by management will probably involve some intense negotiation over a long period of time.

The Wildlife Resources Commission leases wildlife rights from Duke Power (4,000 acres at the Gorge) on 1,150 private acres, and from Champion Paper (9,850 acres at Lake Adger). These rights involve management but are not so restrictive as they might be in terms of protecting all wildlife. The maxim underlying wildlife rights is that management consists of enhancing game species, "protecting" those species by encouraging good sportsmanship, and discouraging any forms of animal or game habitat harassment. The Wildlife Resources Commission officer does not police campers by the side of the river, but may discourage campers from continued use of a trashed or damaged campsite near a wildlife clearing. The Commission does assist the landowner in protection against trespass and fire. These distinctions have been the source of some of the friction in the Cove. It is clear from a glance at the N.C. Gamelands Maps that the Wildlife Resources Commission is the major manager of Green River Lands—whether direct or indirect.

Although Crescent Timber and Land Company neither owns nor leases in this area (Duke Power information), there has been a limited timber cut by Crescent for management of the southern pine beetle (Sam

Left: Low water on the Green. Above: Canoe race weekend. Below: Annual trash pickup by local conservation groups.

Thomas information). At this time such management has little effect on the entire region.

I have identified five plans, or strategies, for management in the Green River area. I will discuss these solely in order to emphasize the many years spent planning for some type of integrated approach to using the Green as a resource. Many people have spent years formulating one or another of these plans. There are those who have thought about this area in their own terms—in other words envisioning a more harmonious future. These people may or may not have been consulted on their views; in any case they don't ascribe to one or the other "official" plan. In total then, I should say there are six plans and it is hard to tell which one was formulated first.

Duke Power, upon purchase of the Tuxedo and Turner hydro plants, began its long-range planning for this region, taking into consideration the demands placed on Cliffside (supplying electrical power to most of this region) and the probability of population growth in the market area. Lake Adger is not long for this world—not as a water impoundment for a 5-megawatt power station. Lake Summit is reaching its twilight years as well. Duke has purchased its 6,000 acres in order to be able to construct a pumped storage hydroelectric plant working in connection with the projected Keowee-Toxaway plant on the North Carolina-South Carolina border.

EPIC, a power cooperative, has also prepared a plan to use the Green between the Gorge and Lake Adger for a pumped storage plant of its own.

The Wildlife Resources Commission hopes to acquire game rights along much of the land separating its two largest game areas at either end of the Cove. The WRC also hopes to purchase inholdings on its owned lands. This will greatly improve its ability to manage the game in the region.

The Division of Parks and Recreation, in N.C.'s Dept. of Natural and Economic Resources, has twice prepared plans detailing the river's inclusion in the State's designated Wild and Scenic Rivers system. Management aspects of each plan include strip parks along the wild river, and the more recent plan recommends acquisition of additional land for a land-based recreational experience in connection with water-oriented strip parks.

Finally the local Advisory Committee has met a number of times in an attempt to reconcile individual differences and present certain common requirements —such as trash pick-up, policing for alcohol and drugs —for first consideration to appropriate local, county, and state authorities. Not many of this committee's efforts have been successful, and there is a certain

Campers create a debris problem along parts of the Green River. Such use is difficult to handle.

amount of mistrust among its members.

The Tragedy of the Commons

In Parts I and II of this series on the Green River I have referred to this area as a frontier. Considering its 8,500 year record of human occupation I suppose my choice of terms seems perverse. But a frontier can be a state of mind, or an accidental by-product of human expansion, as well as the rough-edged extreme of human experience. In the Green River no single dominant influence has completely tamed the resource. Many different human attitudes toward the river's use have influenced its course, sometimes literally. The mere presence of so many different cultural values in this one small region has presented conflicting patterns of management.

What has happened, I believe, is that the River and its surrounding ridges, its creek and Cove and falls, have been held in common by the many people who have been in the area over the past one hundred years. This is in contrast to the effect of a single dominant user whose management of the resource alters and determines everyone's relation to that resource. Many people have used a bit of the river here, a bit of the cove there, logged this small section of forest or planted corn in that section of the flood plain, constructed a boat dock here, a dam there, a logging road there. The Green River is another example of the village commons. And it is clear that we all can't keep grazing all our sheep here indefinitely.

The damage to this area is everywhere visible. The most breathtaking gorge vista is seen only after two hours of hiking along deeply rutted motorcycle tracks; Fishstop Falls can be seen after hiking through decaying, trash-strewn woodsides. The clear creeks feeding into Cove Creek are littered with aluminum cans. Trash is the by-product of campers, hikers, canoeists, floaters, bikers, hunters, four-wheelers and fishermen. Campers alongside the Green River Cove present two additional problems: trespass and destruction of riverbanks.

Severe erosion results from four-wheel traffic, improper placement of logging roads, and motorbike use. Grading done along county roads (state-maintained secondary roads) has in the past been cause of massive sedimentation into the Green. All the sediment coming off the slopes of the Gorge and Cove eventually arrives at Lake Adger, accelerating the natural siltation rate in this impoundment.

Private timber operations release sediment and log trash into the Green as well, but also create a special visiual blight of their own. A private gravel or sand-washing operation on the Tumblebug, a creek flowing into the Hungry River, has on several occasions released fine-ground stone into these trout waters flowing into the Green River.

This area will be irrevocably altered through private recreational development, through non-selective, intensive clearcut logging, or through construction of a pumped storage or other power station. But many of the less dramatic current users of the Green River will just as surely erode, in a piecemeal fashion, the beauty, traditions, and exhilaration of the Green River and its Narrows, Cove, and falls.

- Letters
- Comments
- This & That

BACK OF THE BOOK

N. C. Bowhunters Association

In the winter of 1972, a handful of dedicated bowhunters met in Monroe, North Carolina, to look seriously at their sport and its future. Many topics came up, but it was generally agreed that a strong statewide organization uniting all North Carolina bowhunters certainly was needed. From this emerged the North Carolina Bowhunters Association.

This group of sportsmen has as its ultimate aim "the proper harvest of wild game with bow and arrow in a humane and sportsmanlike manner." The Association stresses the training of bowhunters in safety, shooting skills, hunting techniques, woodland skills, and landowner-hunter relationships. Also, included in the objectives of the group are the wise use of all of our natural resources, and the effective management of our wildlife.

The Association has strict requirements for all of its members in the bowhunting equipment permitted and stresses the methods used in hunting rather than the taking of game itself. N.C.B.A. offers many programs to its members including big game contests, bowhunter training clinics, group small game and big game hunts, bowfishing derbies and other activities.

Questions and inquiries about membership should be sent to: N. C. B. A., 175 Cedar Street, NW, Concord, North Carolina 28205.

REPORT VIOLATIONS

To report a violation of tha gama laws, call North Carolina Wildlifa Resourcas Commission at ona of the following locations:

Location	Area Code	Telephone
Edenton	919	482-4444
Vancaboro	919	244-1717
Burgaw	919	259-4774
Rocky Mount	919	446-3959
Eilzabethtown	919	862-3953
Haw Rivar	919	578-1646
Hamlet	919	582-2101
Jonasvilie	919	835-6426
Morganton	704	437-5131
Marion	704	652-4040
Waynasvilia	704	456-9292
Raleigh	919	829-7191

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Forestry and Wildlife

Dear Sir:

I am a long-time reader—and admirer—of your publication and seldom find reason to complain. In fact, I find myself in agreement with most of what Dr. Mann had to say about the future of sport hunting in the October issue. However, I am afraid he has contributed to some serious misconceptions about forest practices that need to be clarified. Among his list of activities disastrous to game, he includes clearcutting and logging debris, both of which have proven to be a boon to wildlife. All three of his illustrations support this rather than his allegation. The hunting is in the open areas and the cover is in the brush piles. Once these areas restock, the game will gravitate to the new clearcuts. Thus we can have a continuous supply of growing timber and open patches for game as one replaces the other.

Sincerely,
B. M. Cool
Professor of Forestry
Clemson University

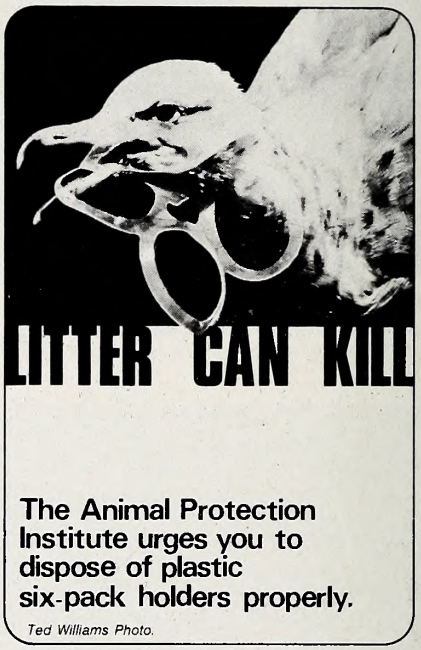
Green River

Dear Sir:

I would like to clarify two items in your October 1976 issue in the article "Do You Know the Green River?" Duke is not required, as stated on page 18, to meet recreational needs by releasing water from Tuxedo Hydro. Duke does cooperate in informing interested inquirers when water releases are planned, but operations of the Turner and Tuxedo Hydro Plants are controlled strictly by power generating requirements and water conditions.

Secondly, in reference to the fourth paragraph from the end of the article, Duke's land in this area is owned by the company itself rather than its timber subsidiary.

L. C. Dail, Chief Engineer
Civil-Environmental Division
By: R. F. Edmonds
Design Engineer



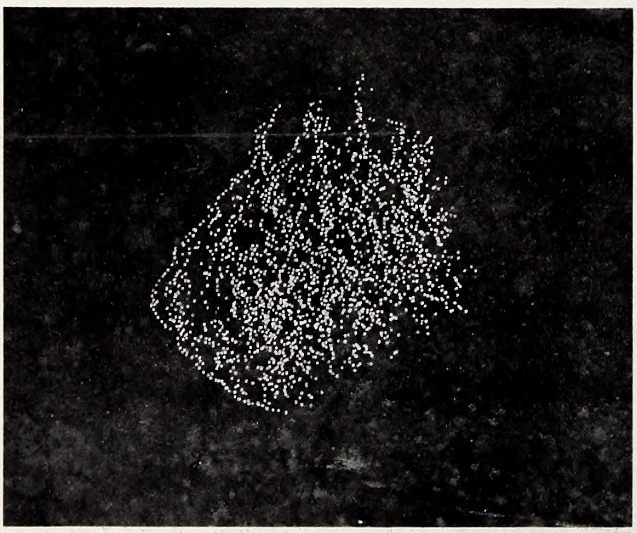
The Animal Protection Institute urges you to dispose of plastic six-pack holders properly.

Ted Williams Photo.

SNOW GOOSE from page 6

rye and pastures on coastal farmlands, causing considerable economic losses to farmers in some cases.

It became increasingly apparent to state and federal waterfowl biologists that the hunting season on snows should be reopened to harvest the surplus birds in order to contain the population within the carrying capacity of their habitat. The population was of sufficient size to justify a hunting season by the late 1960's, but none was allowed until it was determined that the population would maintain itself at that high level. There was probably more scientific study of the snow goose before and since the hunting season was reopened than on any other species of waterfowl. This is partly because there has been no hunting of the birds allowed in the U. S. since 1931 and partly because snow geese lend themselves particularly well to scientific study. For most migratory birds, the ability to count total numbers with accuracy and assemble meaningful productivity data is limited and estimates of total populations leave much to be desired; but this is not the case with snow geese.



Aerial photos are taken of geese both on the ground (or water) and in the air; exact counts of birds in each group are made. From these aerial surveys, population estimates are made for use in determining hunting seasons and bag limits.

By July 1 of each year, waterfowl managers with the U. S. Fish and Wildlife Service have at hand accurate figures on the number of snow geese returning to the nesting grounds, production success form the nesting grounds, and information on the proportion of breeding adults in the population. Combining this information and comparing it to information gathered in previous years, they predict the size of the fall population. The length of the hunting season and the bag limits are determined by these figures.

Photocounts on the St. Lawrence in October check the projected figures. If they were off for some unforeseen reason, the hunting season could be shortened, bag limits restricted or no season held at all. In other words, their habits, high visibility and the fact that the population is confined to a relatively short section of the Atlantic Flyway offers an unusual man-

agement and research opportunity.

This year's snow goose season opens on December 22 in North Carolina and extends through January 21; sometime during that 30-day season I plan to once again be found somewhere on or near Currituck Sound crouching in the frigid waters of a blind, straining my ears for the high-pitched call of snow geese.

It is doubtful that I will be thinking, at those moments of anticipation, of the protection & management programs that brought the snow geese back to huntable numbers, nor of the vast amount of research that has been done on these birds. But it is somehow comforting to know that it was and continues to be revenues from the purchase of hunting licenses and waterfowl stamps that I and other sportsmen buy, plus funds from the excise tax on sporting arms and ammunition, that provide for the protection, management and research on snow geese, as well as for the purchase and maintenance of refuges.

It is sportsmen—not any other group—who can claim credit for bringing the snow goose population up; and they will be among the first to sound the alarm if this bird should undergo a significant decrease in numbers again. But as long as there is a surplus to be harvested, snows offer some of the finest sport to be found anywhere on the East Coast.

STEM TO STERN from page 17

and can be obtained by writing: District Engineer, Corps of Engineers, Post Office Box 1890, Wilmington, North Carolina 28401. There is no charge for the maps.

Navigational charts and maps have also been published by the Tennessee Valley Authority for its major lakes. Maps of Fontana, Hiwassee, Apalachia, Chatuge and major lakes in Georgia and Tennessee are available for a nominal charge from TWA Maps, 400 Commerce Avenue (WPA 4), Knoxville, Tennessee 37902.

There are some excellent publications available commercially which have detailed maps of bodies of water with the most popular fishing spots marked, tide tables, guiding services, fishing articles and tips that may be interesting as well as useful. The "North Carolina Coastal Fishing and Vacation Guide" is one of these books and is available at $3 a copy from many newstands or sporting goods stores in eastern North Carolina or from The Graphic Press, Inc., Post Office Box 26808, Raleigh, North Carolina 27611 (add 50 cents for mailing).

"Fresh Water Fishing and Hunting in North Carolina" and "Salt Water Sport Fishing and Boating in North Carolina" are two excellent fishing guides published in the past by the Alexandria Drafting Company, 417 E. Clifford Avenue, Alexandria, Virginia, 22305. These publications cost $5 each and may be available at some sporting goods stores or by writing to the publisher. Bass fishermen may be particularly interested in bass structures fishing guides of Kerr Reservoir and Lake Gaston also published by Alexandria Drafting Company.

This assemblage of information by no means is a complete list of all the available maps in this state. However, these maps and charts are probably the most obtainable and most widely used publications by boaters and fishermen in North Carolina. How useful they are, of course, will depend upon your particular boating interest.

• NATURE from page 20

come more aware of their natural heritage before it is too late. By setting preservation priorities, the Heritage Program can assist the State in developing the tools it needs to make growth and conservation compatible in North Carolina.

In order to implement the State Heritage Program, the Conservancy needs your help. Government alone cannot do the job—it needs the continued support of North Carolina's private sector. The Nature Conservancy plans to open a state office in North Carolina in 1977. To do this, the Conservancy is launching a $100,000-fund-raising campaign. Half of this amount is needed to create the state office and implement the Heritage Program; the other half will be used as a North Carolina land preservation fund—a revolving fund that would be available for future land acquisition and preservation in the State. In addition, the Conservancy is seeking 2,500 dedicated conservationists to help save North Carolina's significant natural areas.

If you wish to make donations or want to know more about what you can do to help, please write The Nature Conservancy, 1800 North Kent Street, Arlington, Virginia 22209. "Conservation through Private Action" will continue to preserve and protect North Carolina's great natural heritage.

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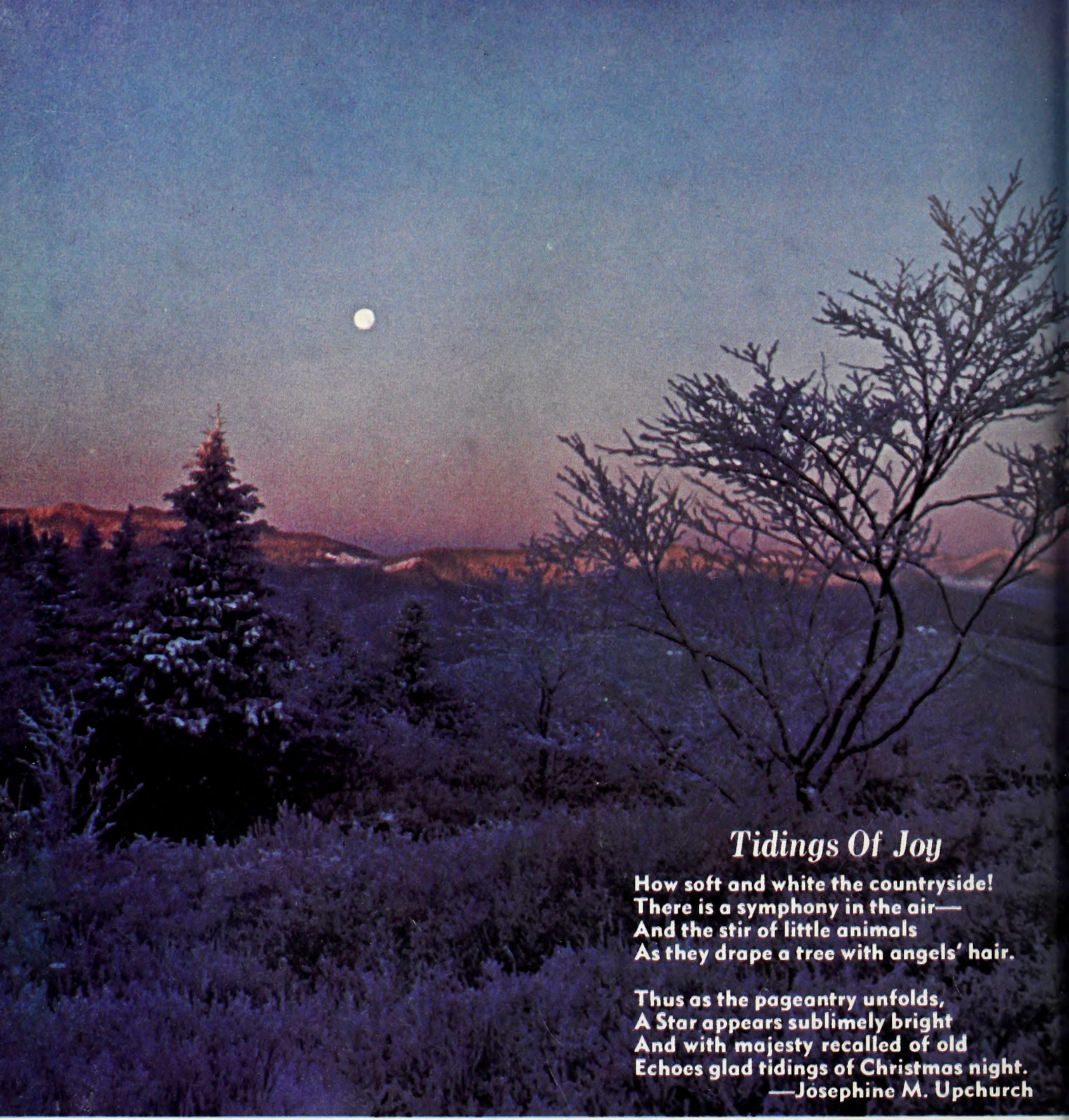

Tidings Of Joy

How soft and white the countryside!
There is a symphony in the air—
And the stir of little animals
As they drape a tree with angels' hair.

Thus as the pageantry unfolds,
A Star appears sublimely bright
And with majesty recalled of old
Echoes glad tidings of Christmas night.

—Josephine M. Upchurch

Photo by Lee Whitmire

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